

Instructions for the installation of Fortran and C compilers,
and a graphics library, on a Windows PC

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Text in bold are either text that you type or icons, menus or buttons that you click.

There are a number of free compilers one can install. Some, such as Cygwin, emulate Linux in a window on your PC, while MinGW runs from a DOS command window. I think MinGW is the easiest to install and run.

To install the Fortran and C compilers on your Windows PC (version numbers as of the above date):

1. Point your web browser to <http://www.mingw.org/>.
2. Click on **Download** in the frame on the left.
3. In the Downloads section, click on **SourceForge File Release**.
4. Download the **Automated MinGW Installer** package to your computer.
5. Double click on **MinGW-5.1.3** to launch the Setup Wizard. If you choose the defaults, then this will create a folder c:\MinGW with all of the binaries, libraries and includes for g77 and gcc.
6. Right click on **My Computer** on your PC desktop, then left click on **Properties** (or go to the Control Panel folder and double click on **System**).
7. Click the **Advanced** tab, then **Environmental Variables**.
8. Select **PATH** in the User variables window (or create it with **New**). Add **c:\MinGW\bin** to the PATH, such as
%PATH%;c:\MinGW\bin;C:\GSAS\EXE.
9. It appears that one does not have to explicitly define the LIBRARY_PATH, so I suggest skipping this step. However, if you find that it is necessary, under user variables, click **New**, then type **LIBRARY_PATH** for Variable name and **c:\MinGW\lib** for Variable value, then click **OK**.
10. Click **OK** as many times as necessary to close the System Properties utility.

You should now be able to compile a program. To test the Fortran compiler with a modified Hello World program, use a text editor such as Wordpad to create a file with the following text:

```
PROGRAM HELLO

CHARACTER YOURNAME*30

WRITE (*, 100)
100  FORMAT(/, ' Input your name: ', $)
READ (*, *) YOURNAME

WRITE (*, 200) YOURNAME
200  FORMAT(//, ' Hello ', A/)
```

STOP
END

Name the file hello.f. Then launch a DOS Command window, **cd** to the folder with hello.f. In the following example, the file hello.f created in c:\MinGW was compiled and run:

```
C:\>cd mingw  
  
C:\MinGW>g77 hello.f -o hello  
  
C:\MinGW>hello  
  
Input your name: Art  
  
Hello Art  
  
C:\MinGW>
```

To install the GrWin graphics library which will allow you to compile and run pgplot programs, do the following:

1. Point your web browser to <http://spdg1.sci.shizuoka.ac.jp/grwinlib/english/>.
2. Scroll down to Contents and click **Download**.
3. Click on [IGrWn0999be-MinGW.exe](#) and save it to c:\temp.
4. Double click on **IGrWn0999be-MinGW.exe** to launch the Setup Wizard. Accept all of the defaults.
5. You may need to define PGPLOT_FONT to c:\grwin\pgplot\grfont.dat in the system environmental variables, although it might be already defined for GSAS. There is also a grfont.dat file with WinGX and ORTEP3 with the variable name PGFONT.
6. In my case I found that the PATH search order is important since there appears to be an older version of grwnd.exe in the GSAS distribution kit that gets installed in the GSAS directory. In that case, if PATH = “%PATH%;C:\GSAS\EXE;c:\MinGW\bin”, the programs will compile (see below), but the graphics windows will not display the graphs and you will get “No window” and “Incompatible library version” messages. Switching the order to “%PATH%;c:\MinGW\bin;C:\GSAS\EXE” should fix the problem.

To test the installation, launch a command window and then type:

```
> cd c:\grwin\demo
> gwf77 trigfn
> trigfn
```

You should see some sine and cosine curves in a graphics window.

To test a pgplot program,

```
> cd c:\grwin\pgplot
> pggwf77 pgedmo1
> pgedmo1
```

When asked for a graphics device, type ? to see your choices. If you choose /cgw, you will see a series of various types of graphs by typing return in the command window

By the way, gwf77 and pggwf77 are batch files which are stored in the c:\mingw\bin directory by the GrWin setup program. You can examine the files with a text editor if you wish to see what they do.