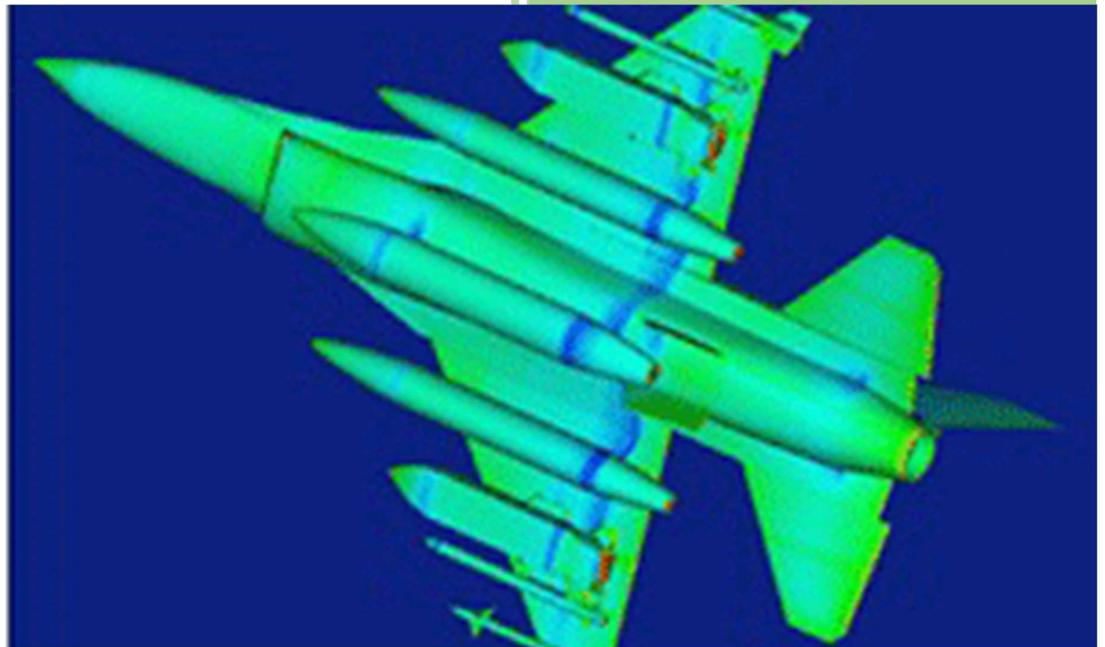


# SwanSim Fortran Development in Windows



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# 1 The Options

In the Linux ecosystem, the availability of C, C++ and Fortran is commonplace via the GNU Compiler collection. These compilers are renowned for being stable, producing code which performs well and being kept up to date with the latest standards in each of the languages – but equally important, they are free.

In the world of Windows, if you are not using Fortran, then the choice became relatively straightforward when Microsoft released the Community Edition of Visual Studio as a free product. This is widely regarded as being one of the best IDEs and is compatible with many languages – except Fortran.

If you require Fortran, then Intel produce a compiler that integrates seamlessly into Visual Studio but it is expensive. If you require a free development environment which incorporates C, C++ and Fortran then a combination of the Code::Blocks IDE and the MinGW compiler suite (these are the GNU compilers built for Windows) has proven to be effective. Unfortunately, the installation of these tools is not as straightforward as it could be. The remainder of this document guides you through the download, installation and setup process.

## 2 Installation

Code::Blocks is available can be downloaded from <http://www.codeblocks.org/>. There is a download that comes bundled with the MinGW compilers and uses a simple installer. However, these compilers are limited to producing 32-bit software which has a number of disadvantages:

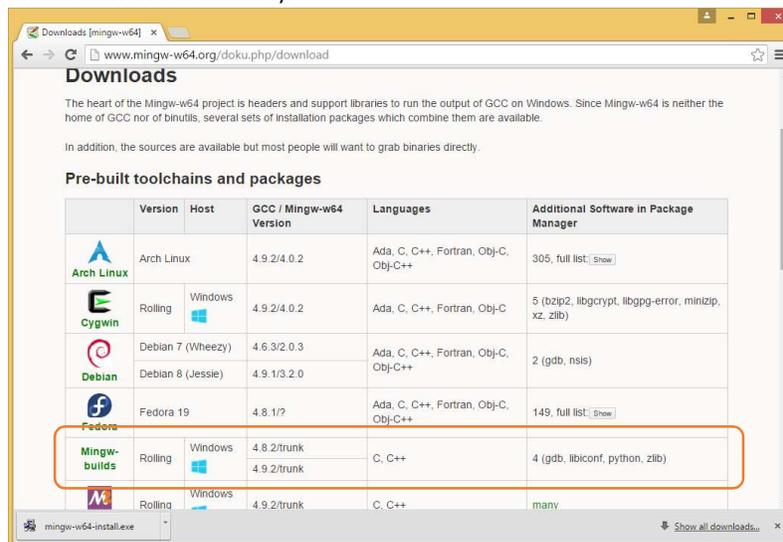
- 32 bit software is limited to using 2Gb of memory
- 3<sup>rd</sup>-party libraries are increasingly dropping support for 32-bit versions of their software as the nearly all new installations of Windows are 64-bit.

In order to use Code::Blocks with 64 bit compilers, Code::Blocks and the compiler suite must be downloaded and installed separately.

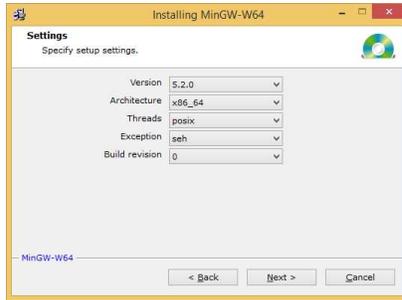
### 2.1 Installing MingW-w64 Compilers

The steps for downloading the compilers is shown below:

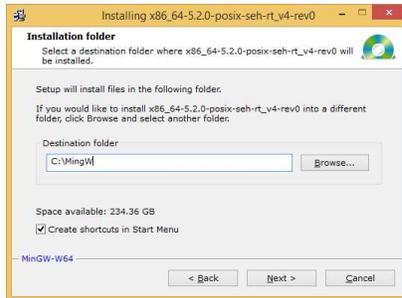
1. Download the latest Mingw-w64 compilers
  - a. Go to <http://www.mingw-w64.org> and then click on the 'Downloads' link.
  - b. When you go to the Download page you will be presented with a number of 'Pre-built toolchains and packages'.
  - c. Select the 'Mingw-builds' set (For some reason it doesn't have FORTRAN listed but it is included in the download).



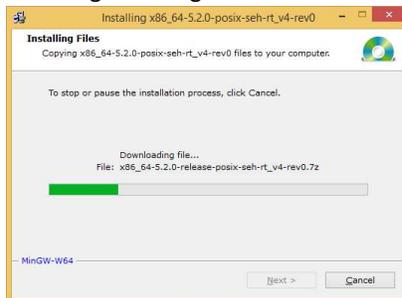
- d. It will then present you with a link to the SourceForge web site and the download will commence.
2. Install the latest Mingw-w64 compilers
    - a. Run the installer
    - b. Click 'Next' to get to the 'Settings' panel. Change the Architecture to 'x86\_64' and then select 'Next'.



- c. The Destination folder is now shown. It is best to change this to a shorter path with no spaces. A typical example would be 'C:\MingW' as shown below.



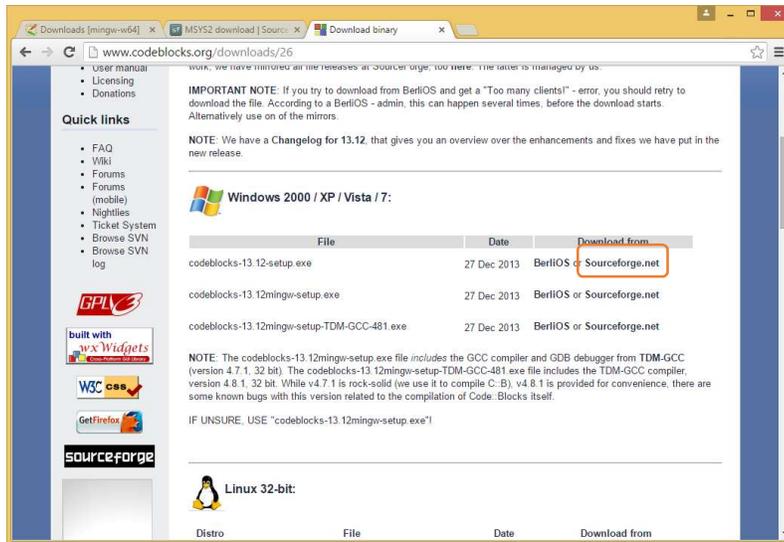
- d. Selecting 'Next' again will start the installation.



- e. Finish the installation by selecting 'Next' and 'Finish'

## 2.2 Installing Code::Blocks

1. Go to <http://www.codeblocks.org>
2. Click on 'Downloads'
3. Click on 'Download the binary release'
4. Scroll down to the 'Windows 2000 / XP / Vista / 7' section
5. Click to download the Code::Blocks setup.exe file (do not choose any links which name 'mingw')



6. Run the Installer
7. Click through each of the panels without changing any settings.

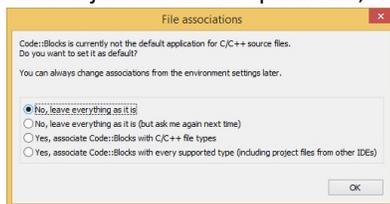
## 2.3 Configuring Code::Blocks

Once Code::Blocks is installed it needs to be configured to find the compilers. This is performed once only.

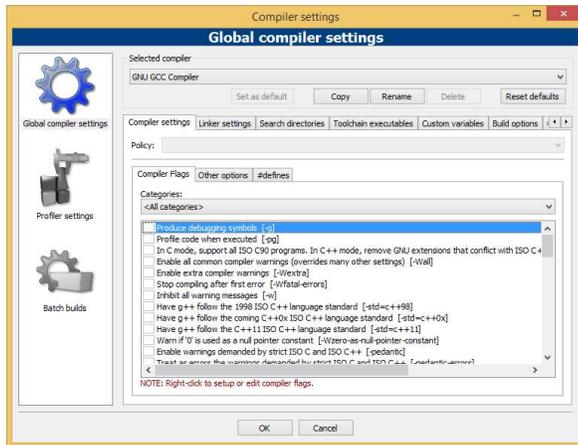
1. Run Code::Blocks. The first time this is run it will try to find compilers to use but will probably not be able to find any. Click 'OK' anyway.  
(If you have also Visual Studio installed then it may find those compilers)



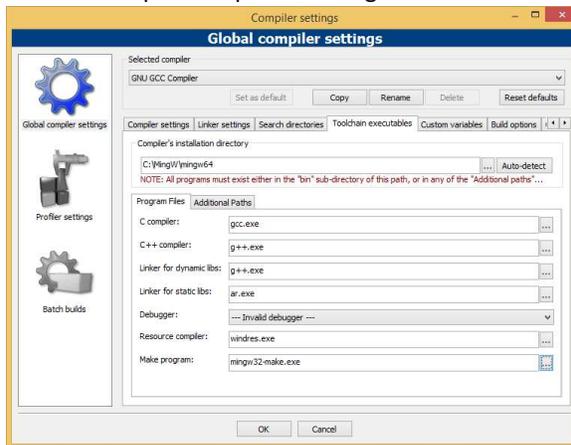
2. The next panel asks if you want Code::Blocks to be the default tool to open C/C++ files. If you are only going to use Code::Blocks then you may leave this as the default option. If you do not want to then just select the option 'No, leave everything as it is'.



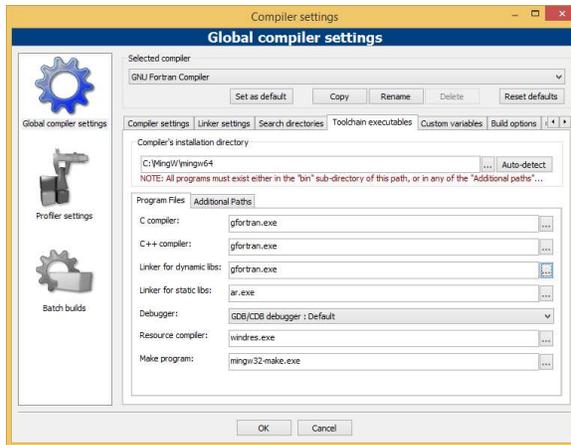
3. Once Code::Blocks has started, go to the 'Settings' menu and select 'Compiler'.



4. We now need to tell Code::Blocks where the C and C++ compilers are installed. Go to the 'Toolchain executables' tab.
  - a. Under 'Compilers installation directory', you need to browse to the folder containing the compilers you installed previously.
  - b. For each of the entries in the section below you need to browse to the 'bin' folder and select the correct executable. If everything was installed as per these instructions you should end up with a panel looking like this:



- c. Click 'OK'.
5. We now need to do the same for the FORTRAN compilers.
  - a. Select 'GNU Fortran Compiler' from the menu at the top of the panel, browse to the same compiler installation folder and then choose gfortran for the top 3 entries as shown below.



b. Do the same for the 'G95 Fortran Compiler' – this is also called 'gfortran.exe'.

