

Skeinforge and Printing

Converting .stl files to G-Code

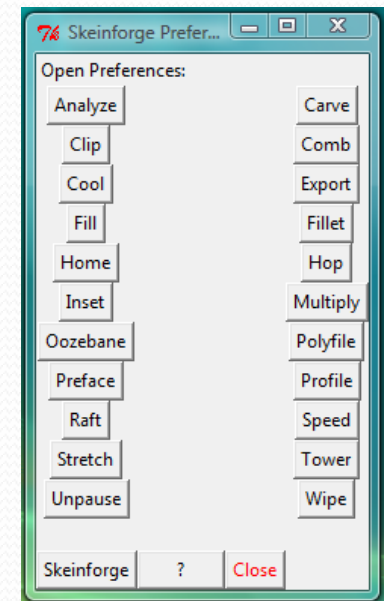
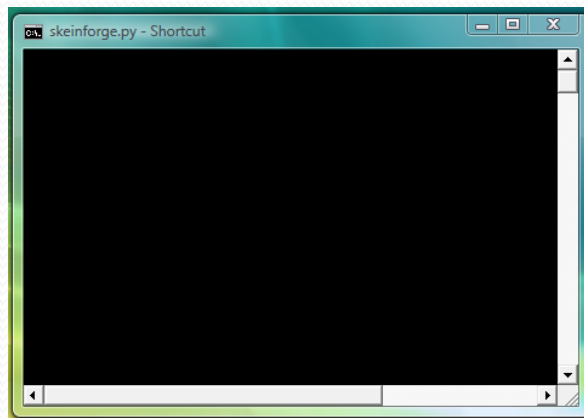


Before you start

- Before you can start converting your stl files into G-Code you will need to install some software onto your computer. You will need...
- Python: this a powerful cross platform language. This must be installed as the program that converts files to g-code is written in Python. At present it is best to use python 2.x. It can be downloaded from <http://www.python.org/download/>
- To speed up Python you can also install Psyco. This can be downloaded from <http://psyco.sourceforge.net/>
- Skeinforge: This is a tool chain composed of Python scripts that converts your 3d model into G-code instructions for Rapman. This can be downloaded from http://members.axion.net/~enrique/reprap_python_beanshell.zip
- Note, all of this software is open source and “free”. Discussion of the open source concept is a very worthwhile activity with students.
- Further help and support can be obtained from the Bits from Bytes website, forum and wiki.

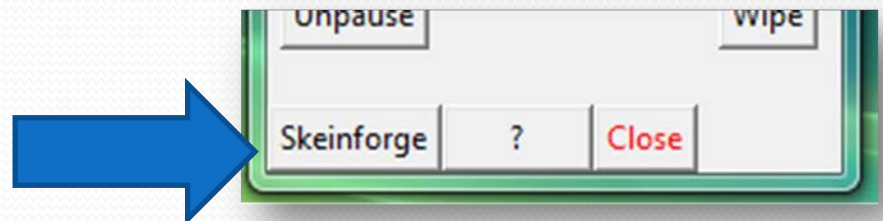
Skeinforge

- Assuming you have all the software installed you are now ready to convert your stl files into g-code.
- First start up Skeinforge. Its not a very pretty program all you should see is a black “shell” window and a “preferences” window.



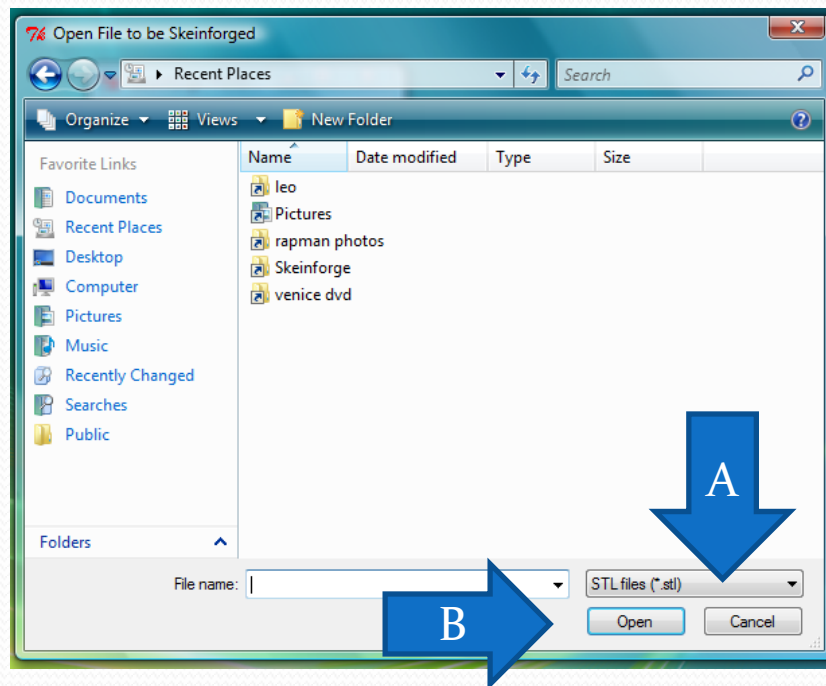
Preferences

- There are hundreds of settings that can be configured in Skeinforge. These settings are beyond the scope of this lesson and should not be fiddled with until you have done a few prints. The most common (default) settings can be found on the Bits from Bytes wiki <http://www.bitsfrombytes.com/wiki/index.php?title=Skeinforge>
- Note that the settings need to be configured BEFORE running the programme to generate the G-code
- So, for now just click the “skeinforge” button.



Open the file

- In the dialog box make sure that stl is selected as the file type (A) and then browse to the file location. When the file has been selected click on open (B).

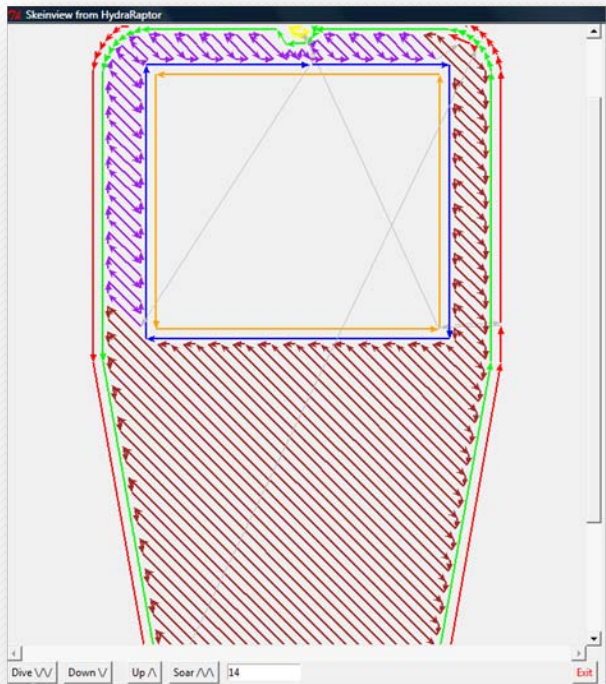


Generating the code

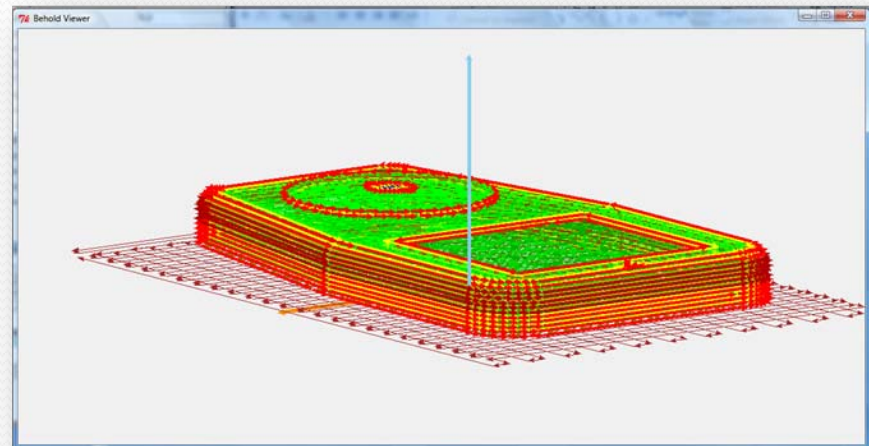
- As soon as you click “open” Skeinforge will start to generate the G-Code with the settings that have been made in the preferences window.
- Generating the code can take a L..O..N..G Time. Please be very patient.
- All you will see for some time will be some text in the “shell” window.... Don't worry, this window will eventually give you some feedback about the code that is created.

Previews

- You will (eventually) see some new windows open on screen and incidentally the G-code file will have been saved to your computer.

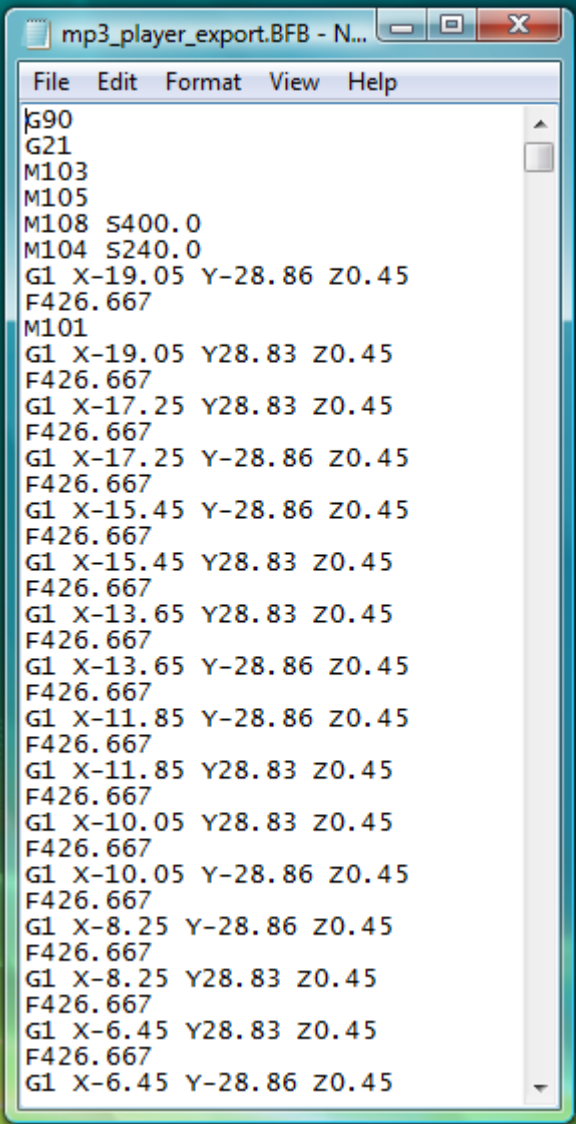


- One window gives a 3D representation of the path taken by the extruder.
- The other window allows you to step up a layer at a time to see how the object will be printed



The G-code file.

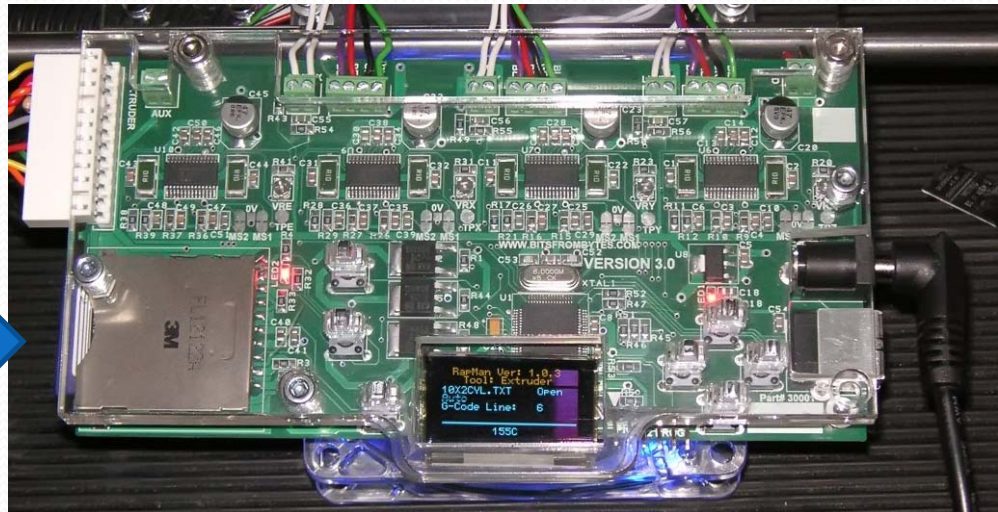
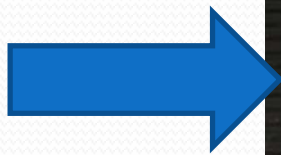
- If you open the G-code file (using Windows Notepad) you will see that it contains hundreds of lines of Text and numbers. These are the instructions that RapMan understands and control all of its movements.
- The codes are basically just instructions to turn on or off the extruder, set the temperature or 3D co-ordinates for the movement.

A screenshot of a Windows Notepad window titled "mp3_player_export.BFB - N...". The window displays a list of G-code instructions. The instructions are: G90, G21, M103, M105, M108 5400.0, M104 5240.0, G1 X-19.05 Y-28.86 Z0.45, F426.667, M101, G1 X-19.05 Y28.83 Z0.45, F426.667, G1 X-17.25 Y28.83 Z0.45, F426.667, G1 X-17.25 Y-28.86 Z0.45, F426.667, G1 X-15.45 Y-28.86 Z0.45, F426.667, G1 X-15.45 Y28.83 Z0.45, F426.667, G1 X-13.65 Y28.83 Z0.45, F426.667, G1 X-13.65 Y-28.86 Z0.45, F426.667, G1 X-11.85 Y-28.86 Z0.45, F426.667, G1 X-11.85 Y28.83 Z0.45, F426.667, G1 X-10.05 Y28.83 Z0.45, F426.667, G1 X-10.05 Y-28.86 Z0.45, F426.667, G1 X-8.25 Y-28.86 Z0.45, F426.667, G1 X-8.25 Y28.83 Z0.45, F426.667, G1 X-6.45 Y28.83 Z0.45, F426.667, and G1 X-6.45 Y-28.86 Z0.45. The window has a standard Windows interface with a menu bar (File, Edit, Format, View, Help) and a scroll bar on the right side.

```
mp3_player_export.BFB - N...
File Edit Format View Help
G90
G21
M103
M105
M108 5400.0
M104 5240.0
G1 X-19.05 Y-28.86 Z0.45
F426.667
M101
G1 X-19.05 Y28.83 Z0.45
F426.667
G1 X-17.25 Y28.83 Z0.45
F426.667
G1 X-17.25 Y-28.86 Z0.45
F426.667
G1 X-15.45 Y-28.86 Z0.45
F426.667
G1 X-15.45 Y28.83 Z0.45
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G1 X-13.65 Y28.83 Z0.45
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G1 X-13.65 Y-28.86 Z0.45
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G1 X-11.85 Y28.83 Z0.45
F426.667
G1 X-10.05 Y28.83 Z0.45
F426.667
G1 X-10.05 Y-28.86 Z0.45
F426.667
G1 X-8.25 Y-28.86 Z0.45
F426.667
G1 X-8.25 Y28.83 Z0.45
F426.667
G1 X-6.45 Y28.83 Z0.45
F426.667
G1 X-6.45 Y-28.86 Z0.45
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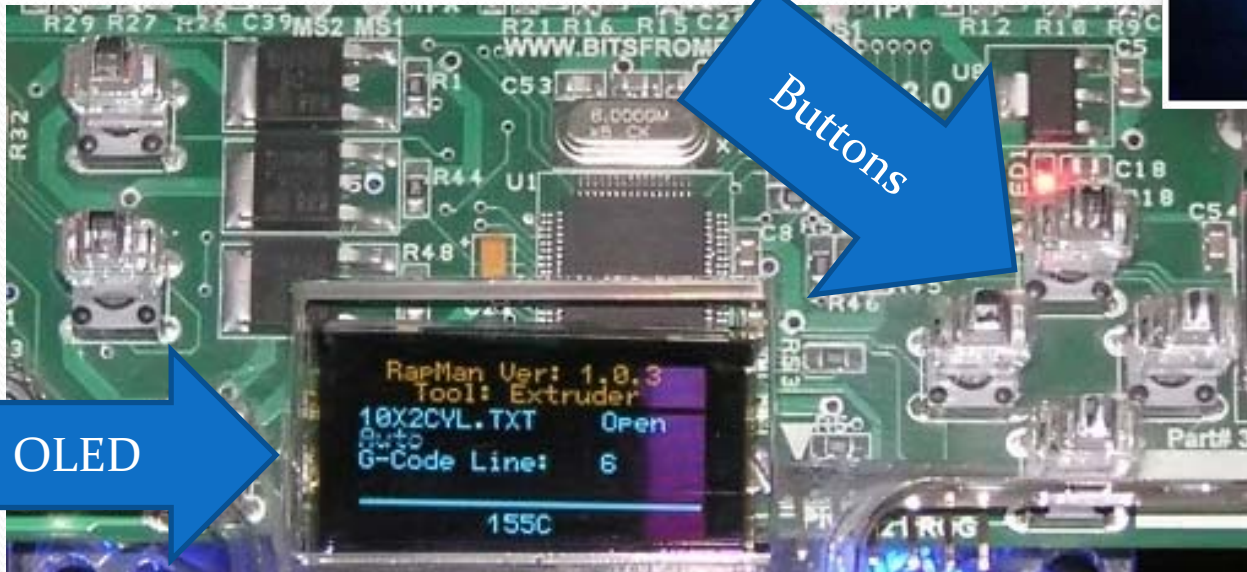

Printing (SD Card)

- The G-code that you have just generated now needs to be copied onto a SD card (this must be less than 2Gb).
- Plug in and switch on the Rapman.
- The card is then inserted into the card holder on the main circuit board.



Printing (Home)

- The Rapman must first be “homed” to reset the machine “origin”. Use the X and Y to select the “Home tool head” command on the main menu on the OLED display and then press “enter”



Printing (Run)

- Select “Run file” from the menu on the OLED and then browse up and down the list to find your file (the newest file on the card should be at the top of the list)
- When you press enter the Rapman should move to the front right hand corner of the machine and pause until the correct temperature is achieved. This can be seen on the OLED screen.

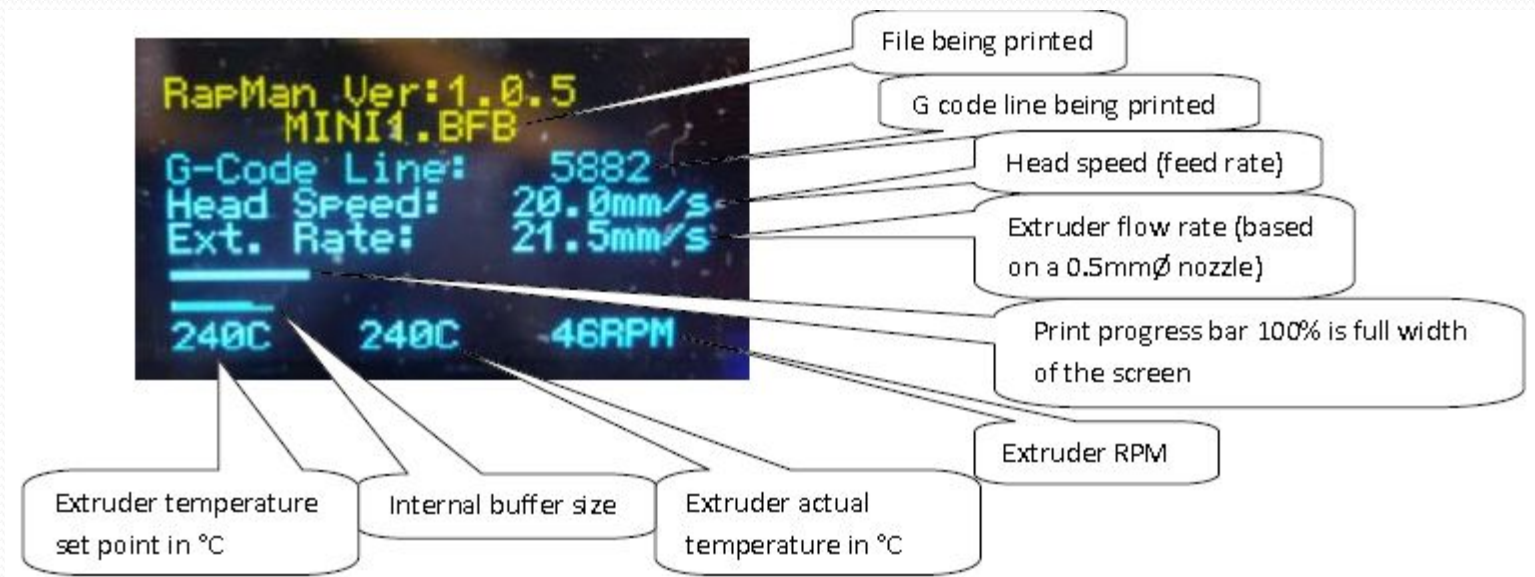


Printing

- When the correct temperature has been achieved the Rapman will start to print a “Raft”. This is a grid that temporarily glues the object to the bed of the machine and then go on to print the actual object after a pause to change temperature.
- If everything is going ok then that’s all there is to it. But adjustments to the speeds can be made “on the fly”.
 - To change temperature use Y+ and Y-
 - To Change extruder flow rate use X+ and X-
 - To change the speed of movement use Zup and Zdown
 - Esc will pause the printer.

Information on the OLED

- When printing the OLED gives feedback on what is happening....



Further Help

- Full details can be found in the operations manual . This can be downloaded from the Bits From Bytes website.

http://www.bitsfrombytes.com/index.php?option=com_content&view=article&id=80&Itemid=100009

- Further assistance can be found on the BfB forum and wiki.

Forum <http://www.bitsfrombytes.com/fora/user/index.php>

Wiki <http://www.bitsfrombytes.com/wiki>