RapMan Basics

Using RapMan

BITS FROM BYTES

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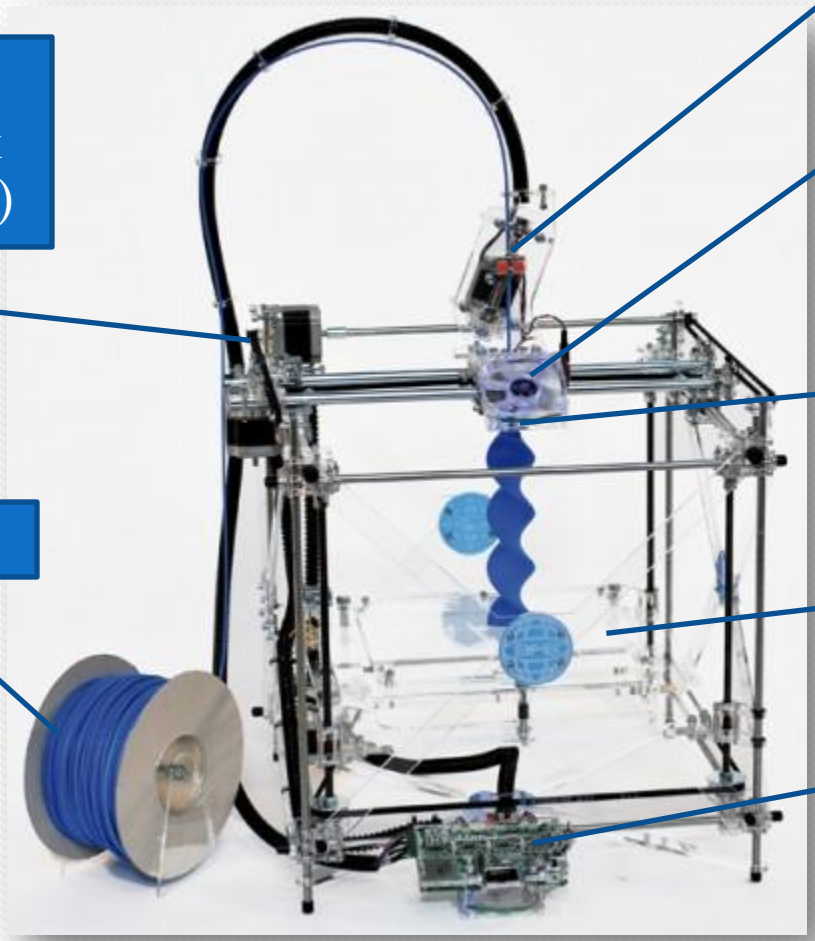
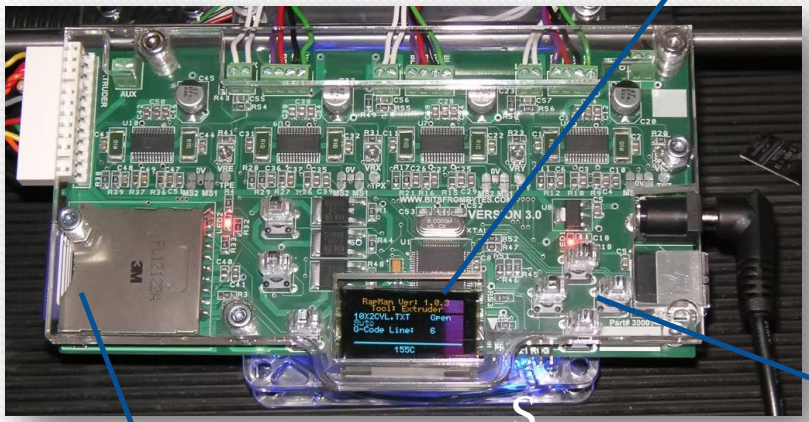
RapMan


Stepper Motors (x and y axes)
Extruder
Fan
"Hot end" (behind fan)
Filament
Print bed
PCB

PCB

OLED Display

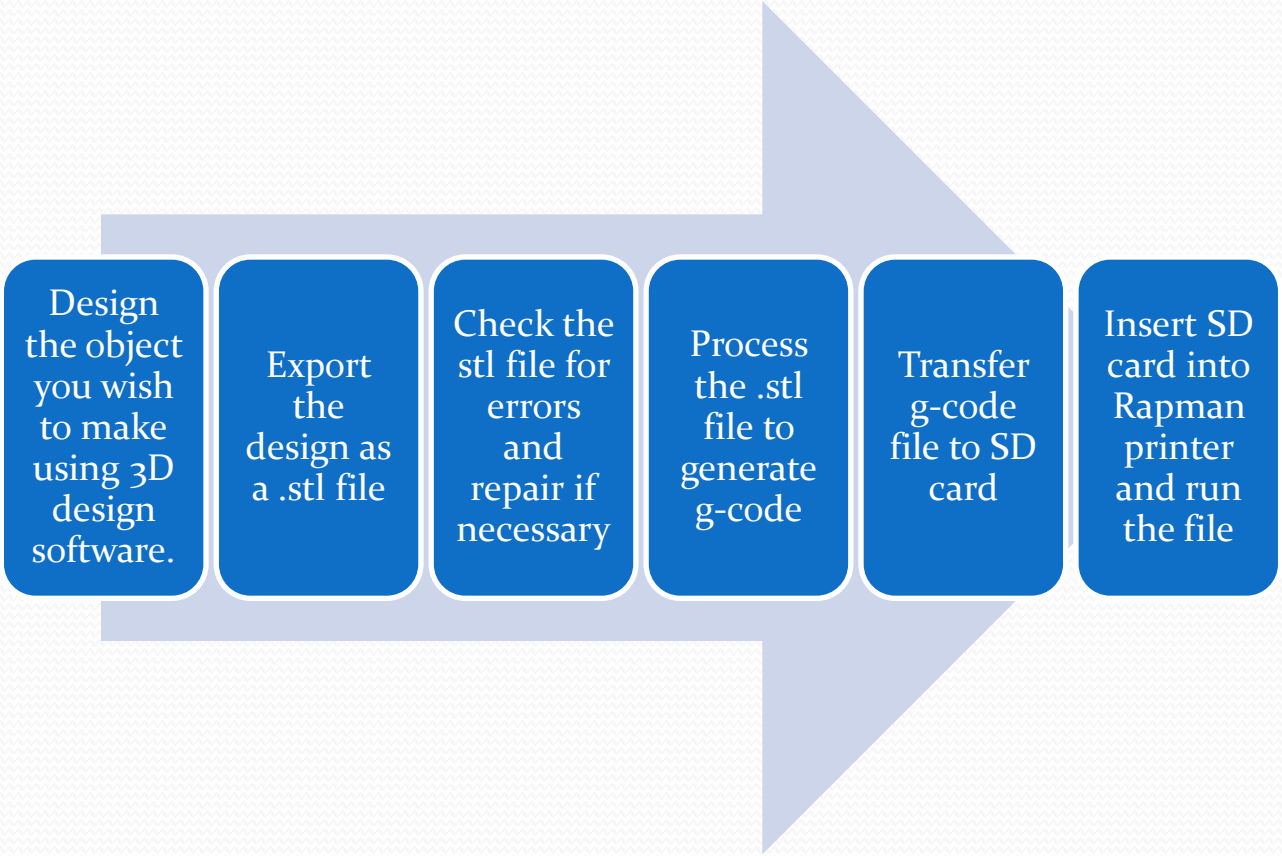


SD Card slot

Control buttons

How to print in 3D

- The basic system for producing a 3D print …



Designing objects

- You can use almost any 3D design software to create parts for making using RapMan…. As long as you can export to a .stl file format.

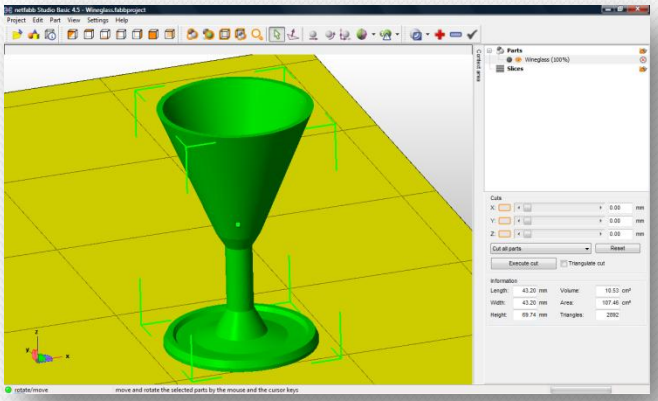
.stl format

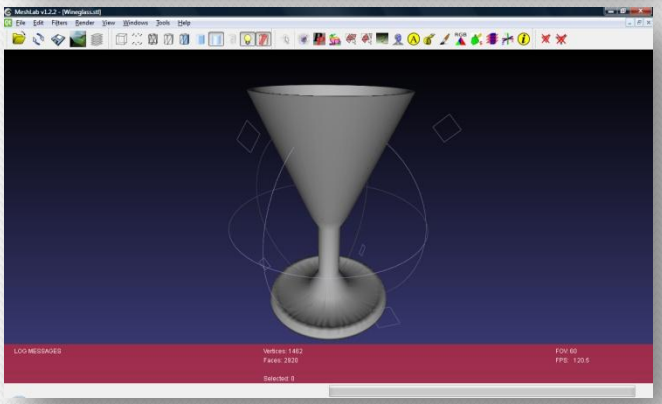
.STL format is widely used for rapid prototyping and computer-aided manufacturing.
STL files describe only the surface geometry of a three dimensional object without any representation of colour, texture or other common CAD model attributes.
The STL format specifies both ASCII and binary representations. Binary files are more common, since they are more compact.

- **AutoCAD**
- Your design must be a three-dimensional solid object to output an STL file.
  Type these commands in AutoCAD's command line:
- Set DISPSILH to 1
- Set ISOLINES to 0
- Set FACETRES to 10
- Relocate the object to the positive X-Y-Z octant
- Use the STLOUT command to export an STL file. (AMSTLOUT for AutoCAD Desktop files)
- **Autodesk Inventor**
- The detail settings for STL Output are stored in the registry. Information on changing the detail level can be found at Autodesk's website, under the title "Set accuracy for exporting STL files from Autodesk Inventor software" and ID TS64378.
- Go to the File menu, then select the Save Copy As... choice
- Select STL from the Types drop-down
- Click the Options button, and choose the High detail level
- Click the Save Button.
- **Pro/ENGINEER**
- Select File, then Save As
- Pick .STL from the Save As Type dropdown menu
- Input 0 for the chord height
- Leave Angle Control at default
- Select OK
- **SolidEdge**
- Select File, then Save As
- Set Save As Type to STL
- Select Options
- Set Conversion Tolerance to 0.001 in or 0.0254 mm.
- Set Surface Plane Angle to 45.00°
- Select Save
- **SolidWorks**Select *File*, then *Save As...*
- Select *STL (*.STL)"*
- Select *Options*
- Set *Resolution* to *Fine*
- Select *OK*
- Select *Save*

Check and repair

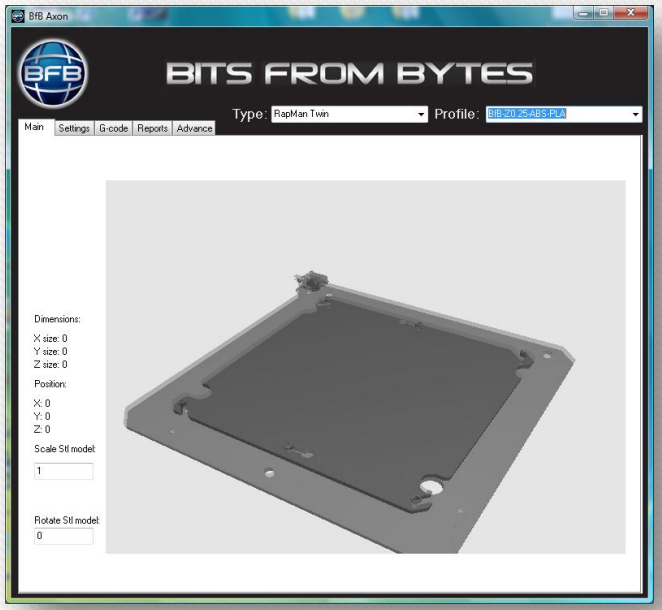
- Before processing the stl file to generate g-code it is a good idea to check the stl file for errors.
- The stl file may be wrong way round, the wrong size, or “broken” due to flipped triangles or missing geometry.
- If you are using Skeinforge or Axon you can use a program such as the free version of NetFabb Studio http://www.netfabb.com/ or Meshlab http://meshlab.sourceforge.net/

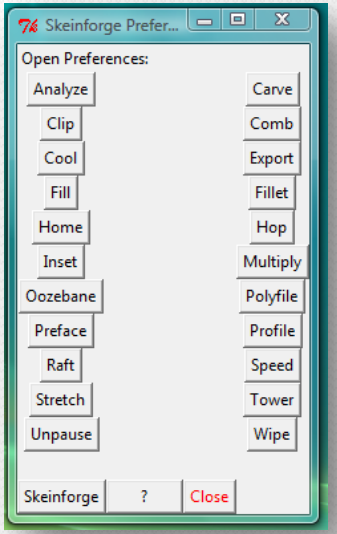




Generate g-code

- The stl file will need to be sliced into thin layers that are to be printed by RapMan. This is done with a free program called Skeinforge, or with BfB Axon



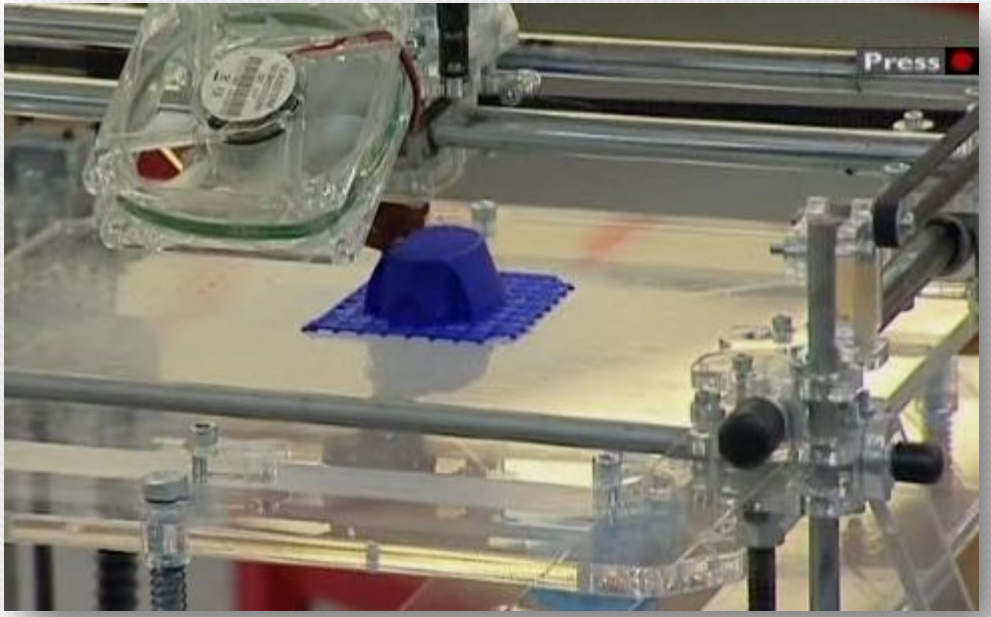


Printing

- 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. After “homing” the machine, the correct g-code file is then selected and run.

Printing

- The print is built up layer by layer on the print bed.
- A variety of different polymers can be used to make the parts, ABS and PLA are the most frequently used.



Generate g-code

- For Information on generating g-code with Skeinforge see the “Skeinforge and printing” resource. http://www.bitsfrombytes.com/wiki/index.php?title=Teaching_Resources

- For information on using BfB Axon see the Website http://www.bitsfrombytes.com

RapMan

- RapMan is a low cost 3D printer available from Bits from Bytes www.bitsfrombytes.com

- 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

Video of RapMan in use in schools can be viewed/downloaded here

- BBC Points West http://www.bitsfrombytes.com/fora/user/index.php?topic=522.msg4540#msg4540
- Becta http://awards.becta.org.uk/display.cfm?resid=41885