

Experiences with 3D Printing

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Rostock Max V2 printer

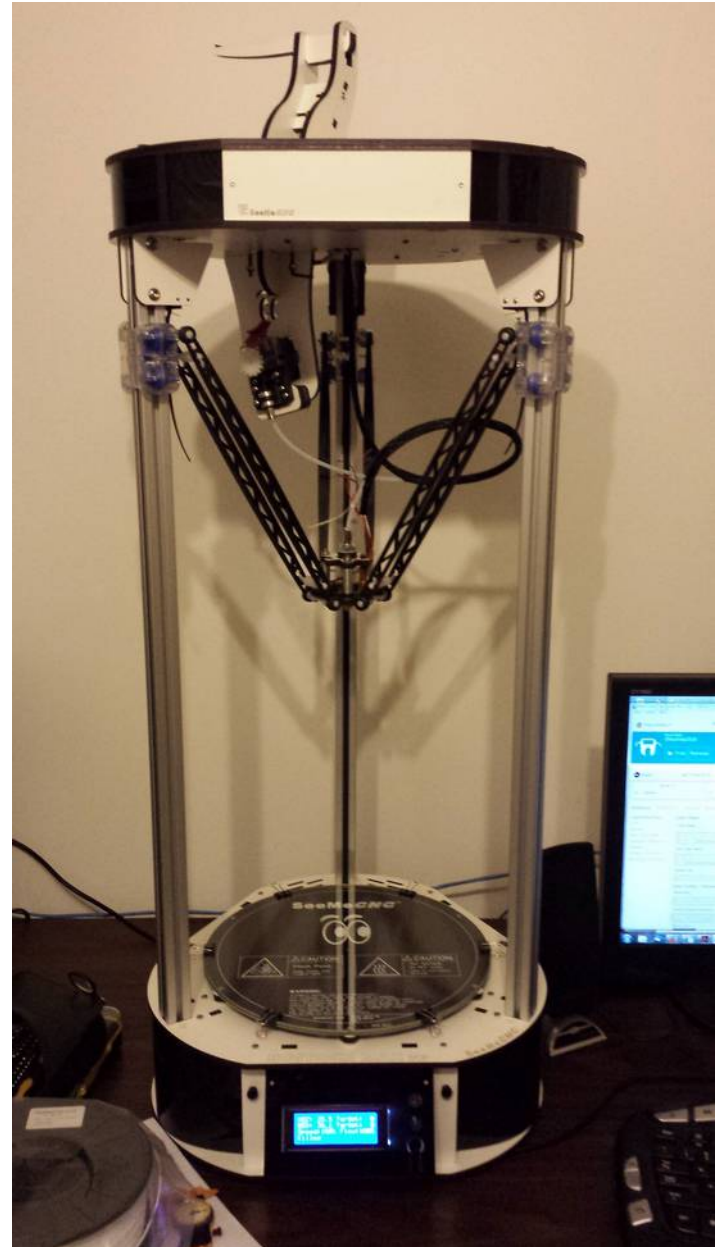
SeeMeCNC.com

Delta configuration

\$900 kit

25-hour assembly time

Large cylindrical build
area: 11" diameter, 14"
height



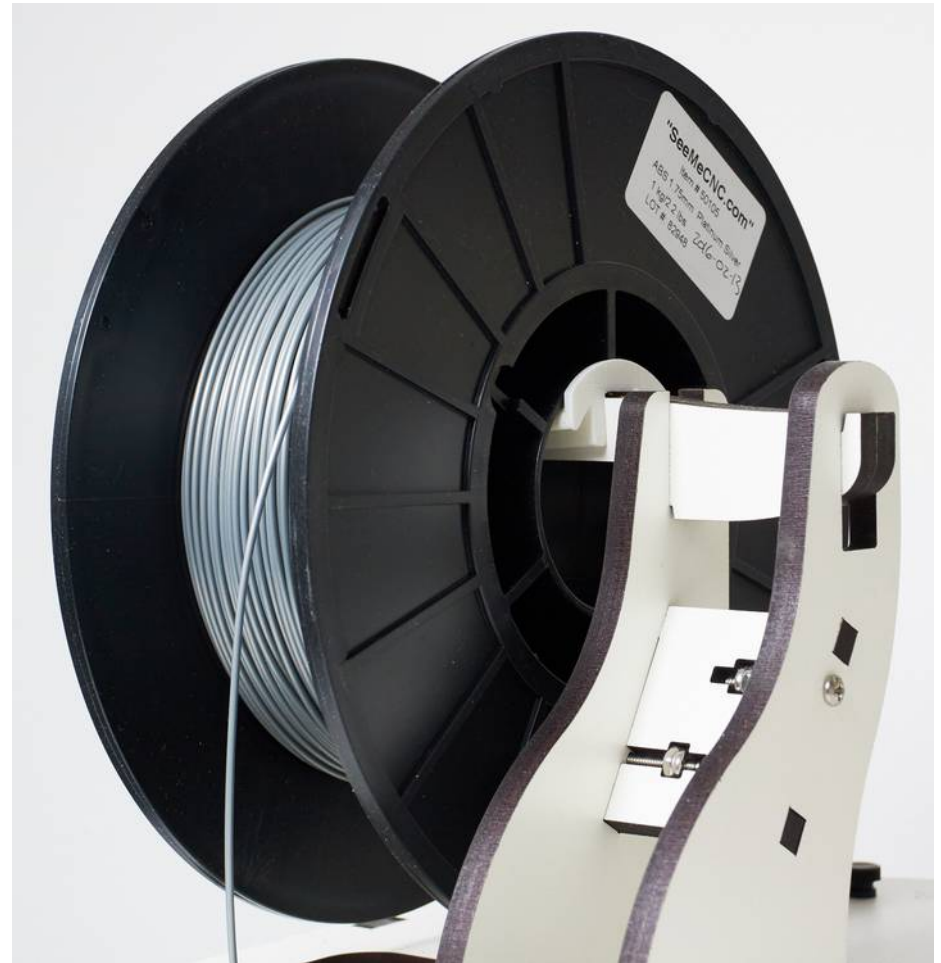
Filament

ABS plastic

~\$40/kg spool

1.75mm dia

Many other materials
available: PLA, nylon,
PET, elastomer, metal
fill, carbon fiber fill,
conductive, glow



Extruder

Feeds / retracts
filament

Stepper motor

Gear drive

Bowden tube

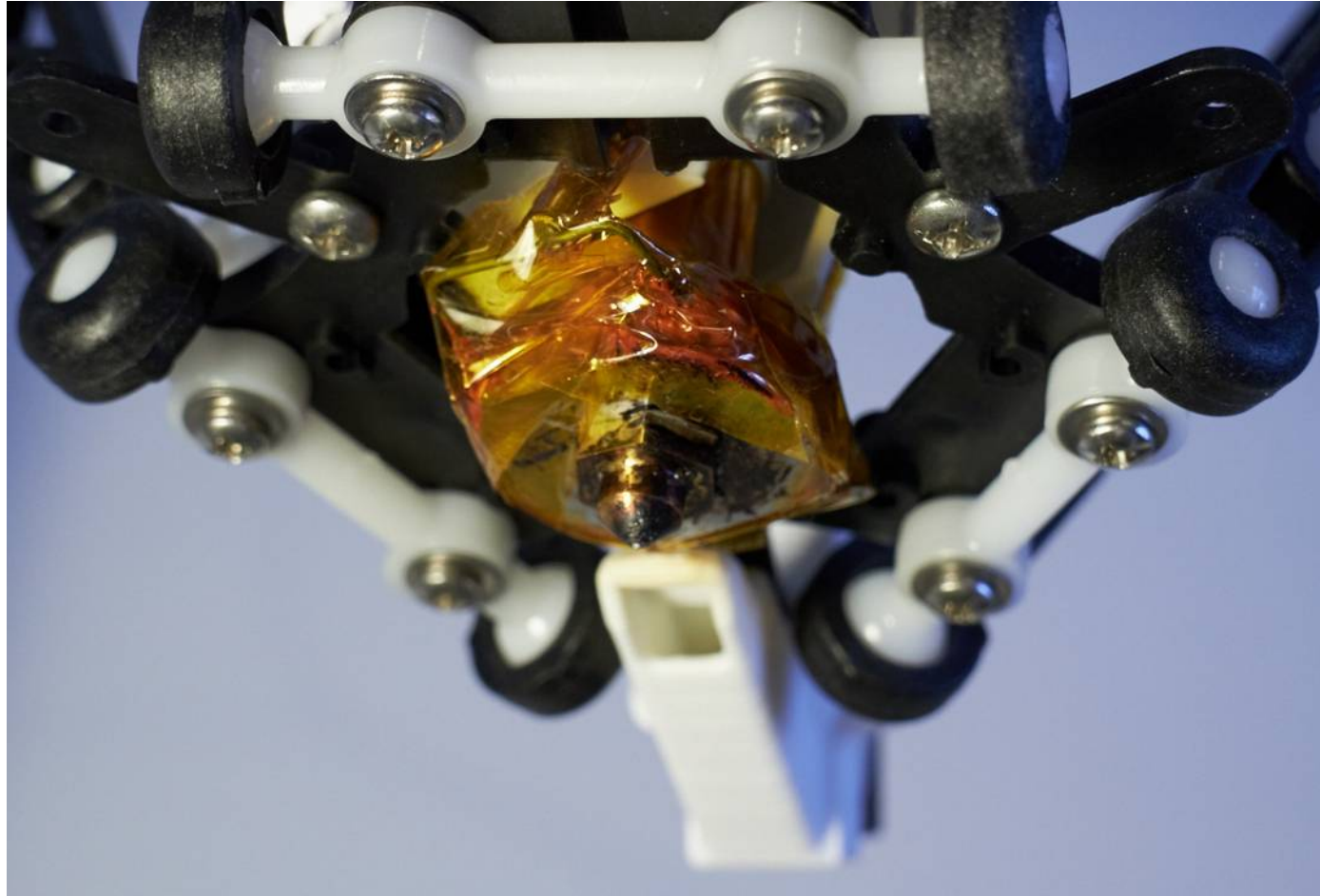


Hot End / Nozzle

Heats ABS
filament to
240C / 464F

0.5mm
extrusion width

Cooling fan



Delta Arms

Stepper motors

Timing belts

Carriages

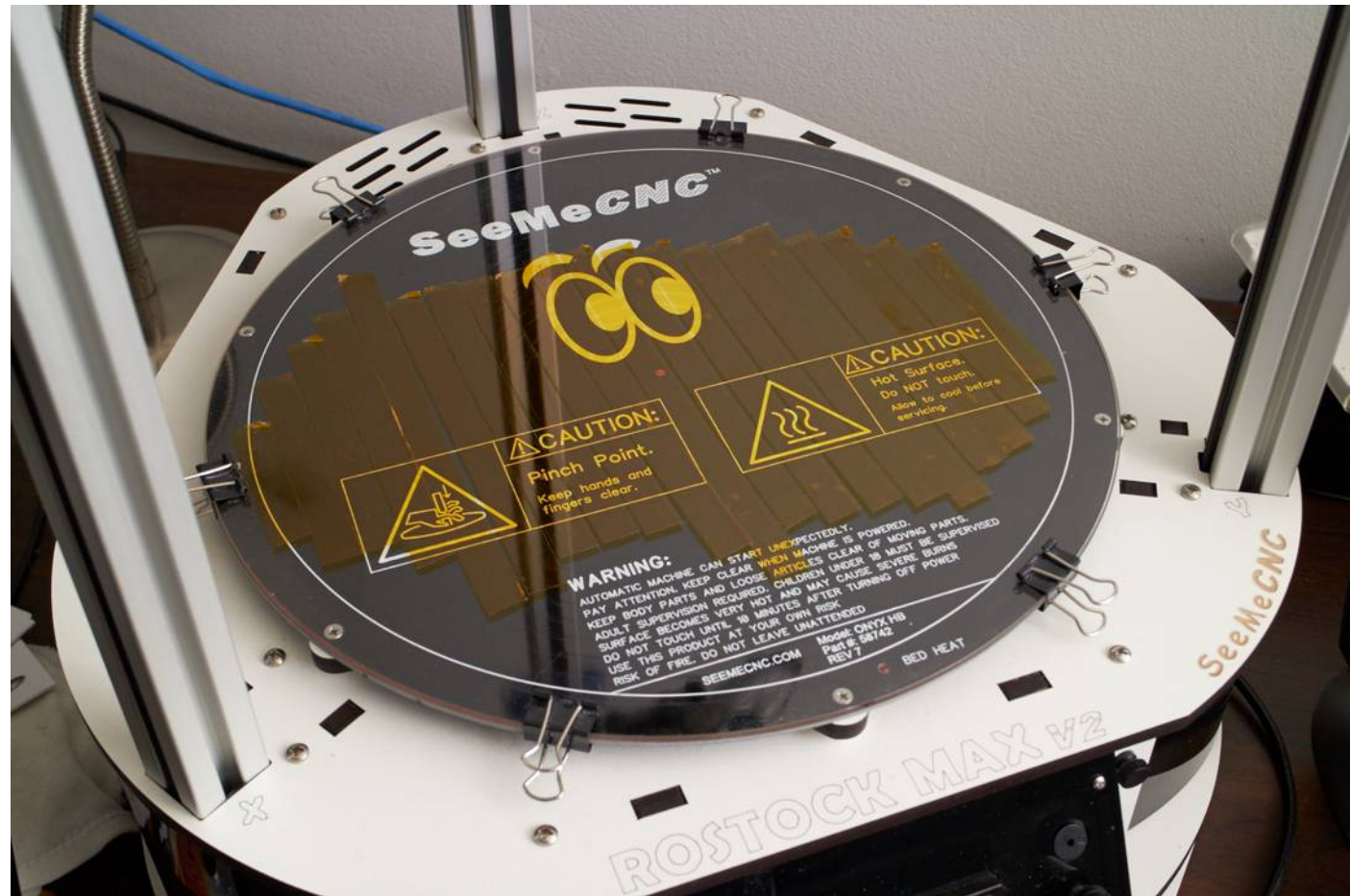


Build Plate

Flat borosilicate glass

Heated to 95C / 203F for ABS

Kapton tape for adhesion



Controller / Panel

Open-source RAMBo
card and firmware
(Arduino)

Stepper drivers

G-Code interpreter

LCD + input dial

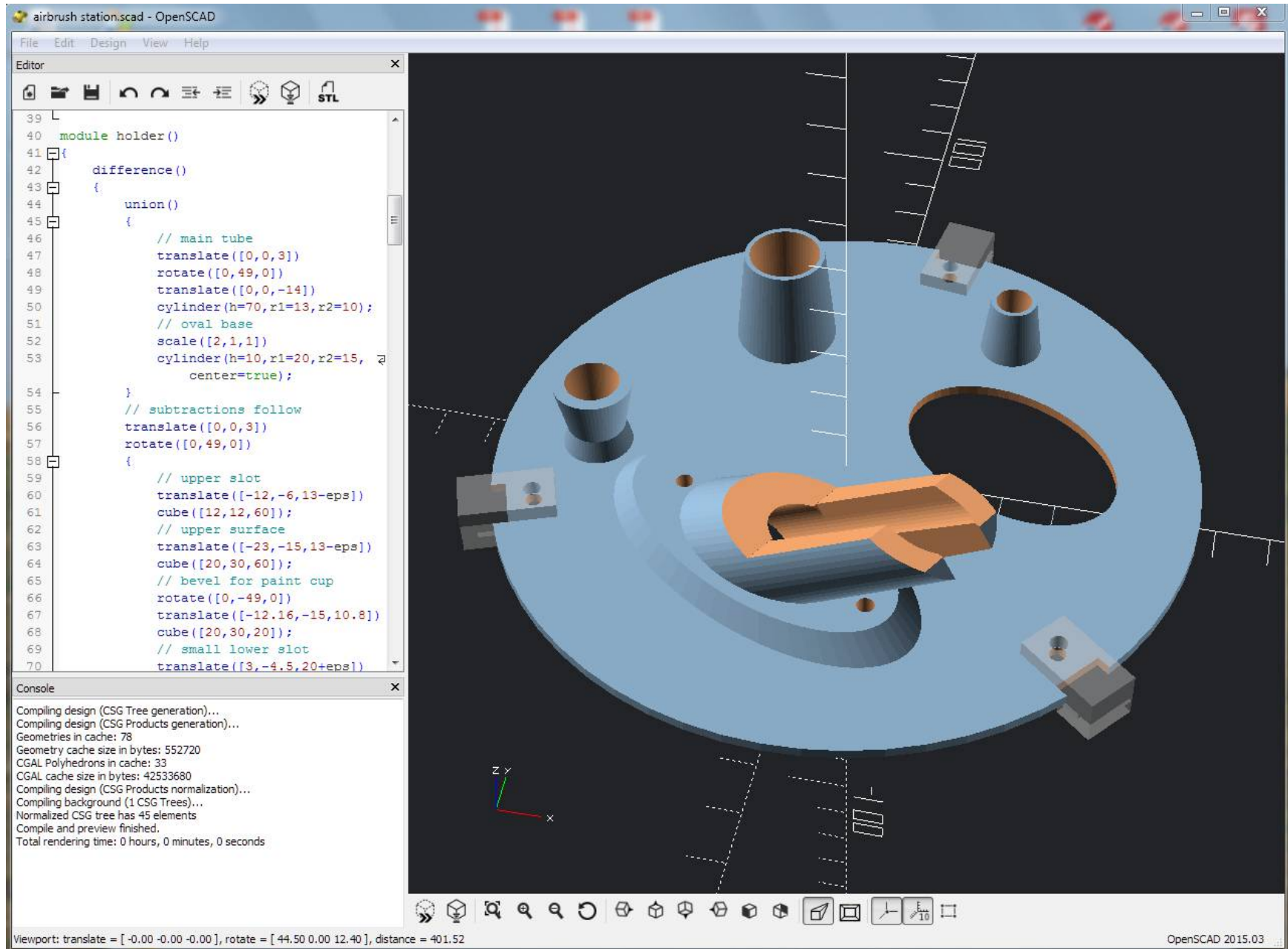
SD card reader

Standalone printing

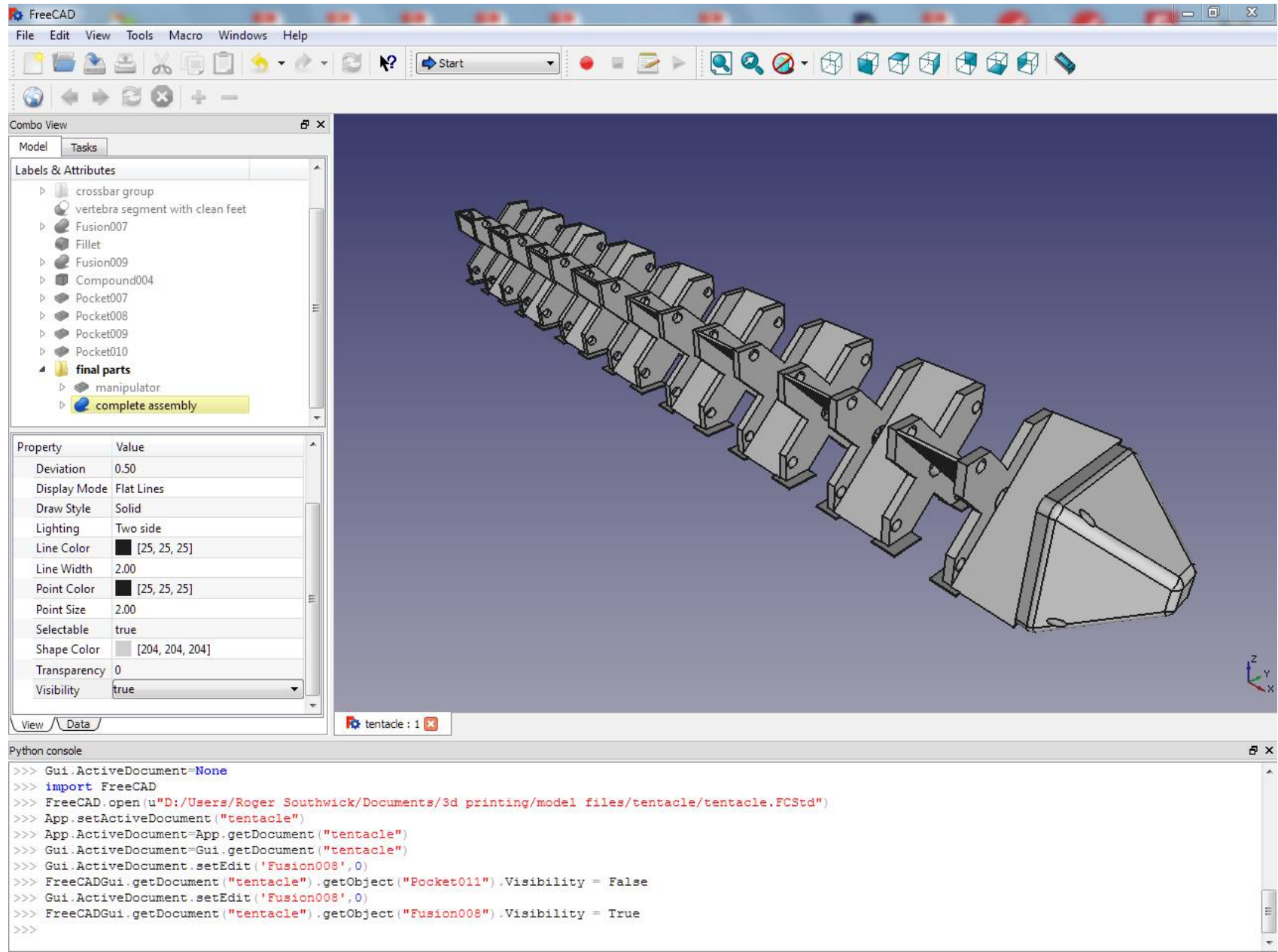
USB control



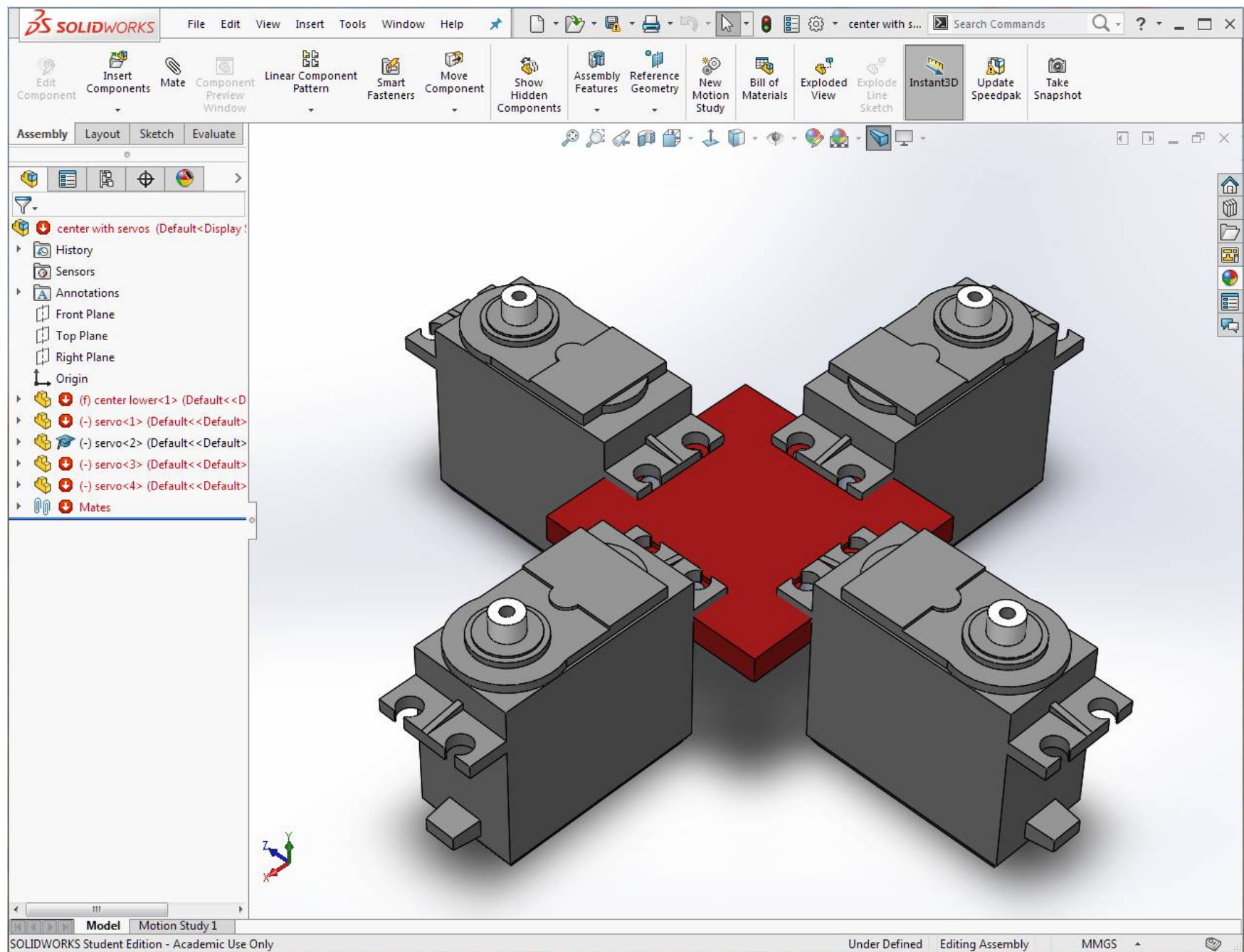
Design Tools - OpenSCAD



Design Tools - FreeCAD



Design Tools - SolidWorks

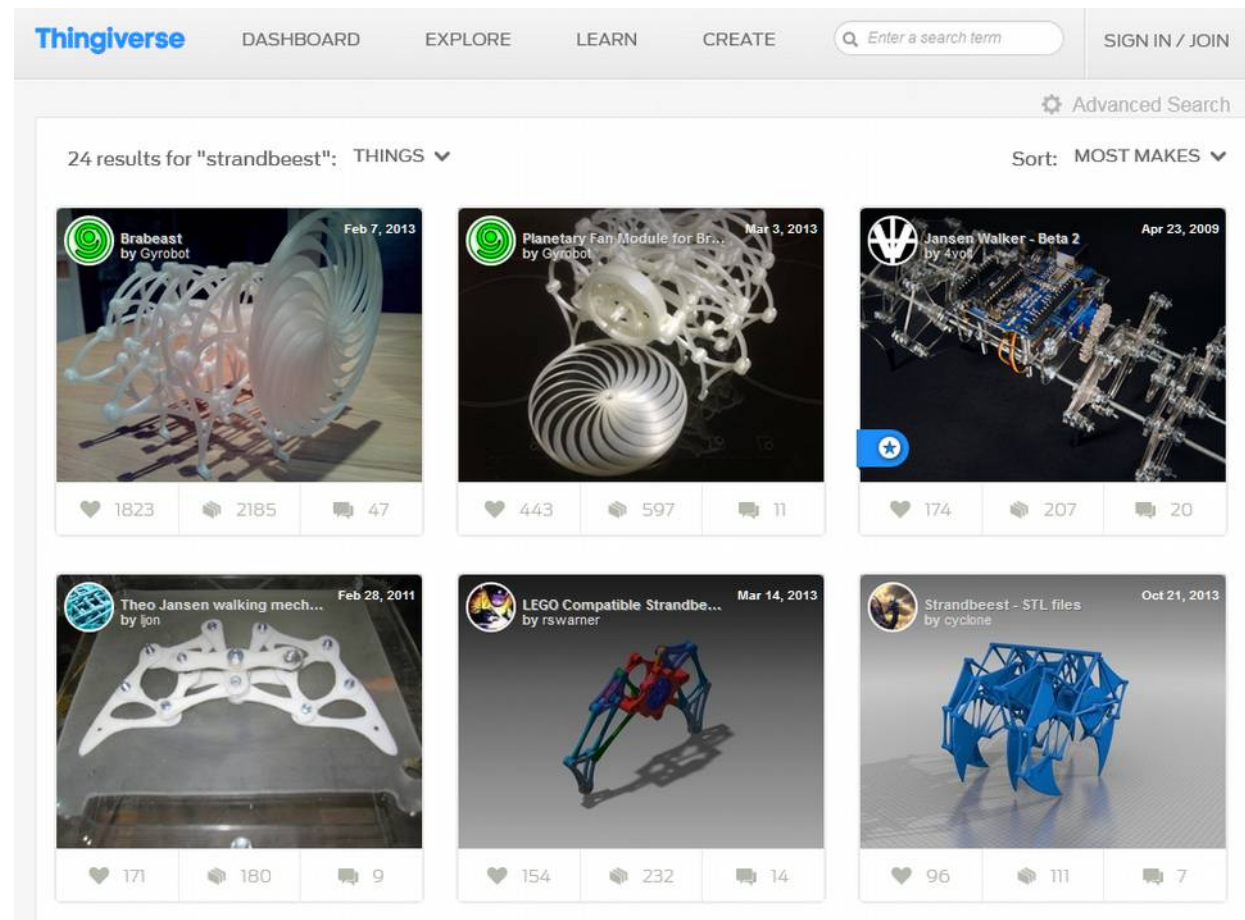


Online Design Repositories

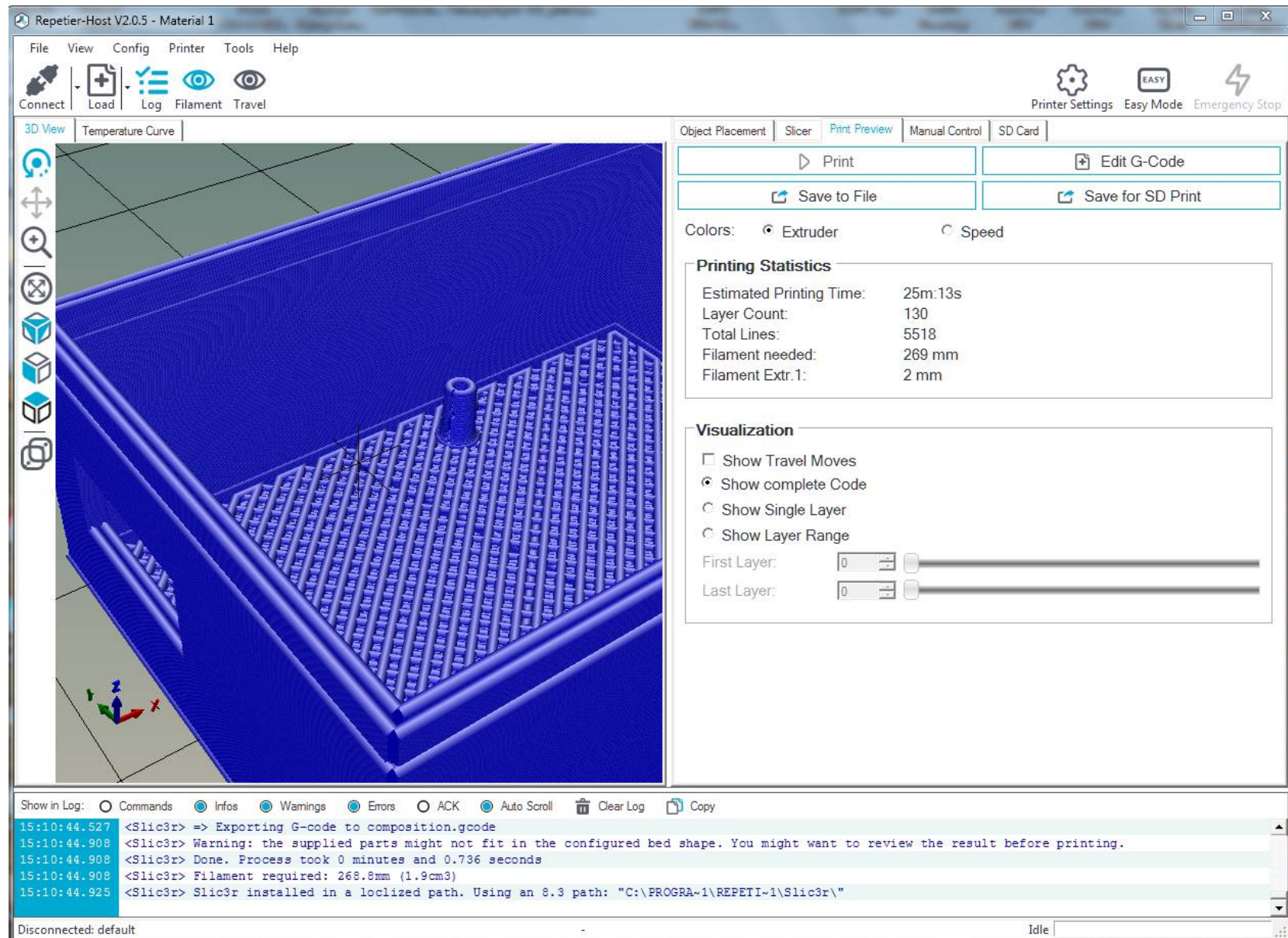
Thingiverse.com

YouMagine.com

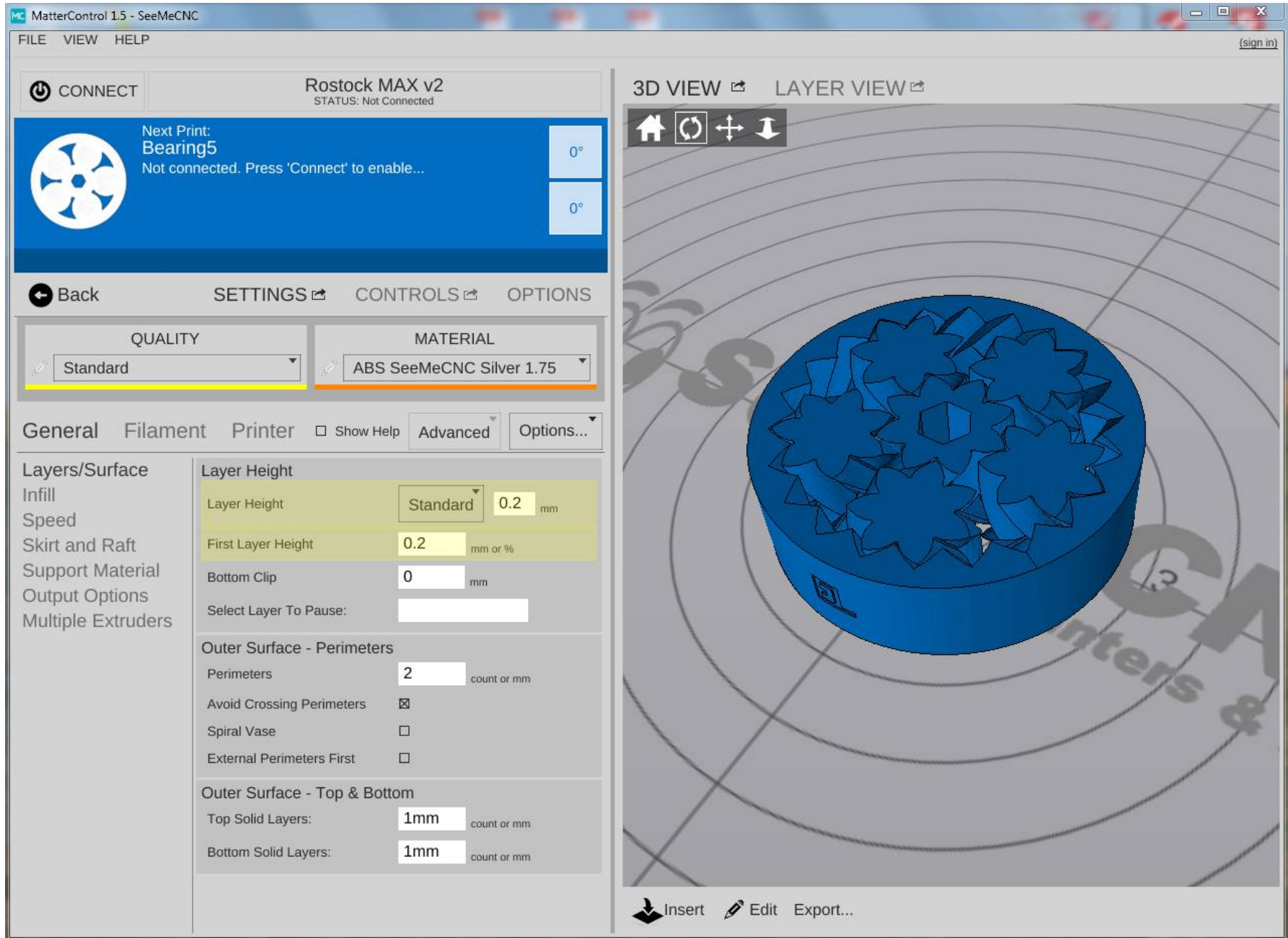
Repables.com



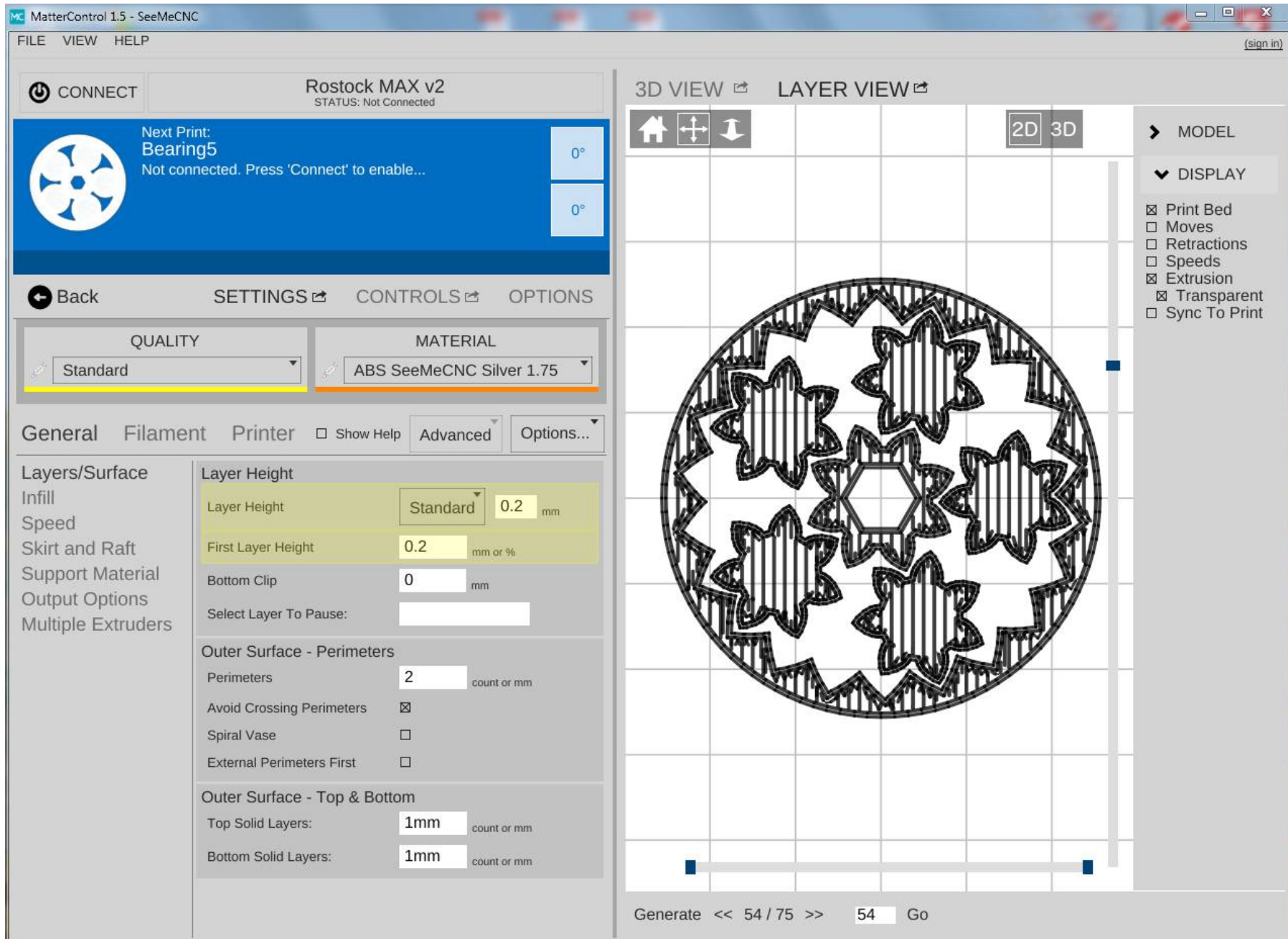
Printer Control – Repetier Host



Printer Control - MatterControl



MatterControl



Challenges

Firmware configuration

Printing parameters, trade-offs

Build plate adhesion, ABS contraction

Filament variation

Environment: humidity, drafts, fingerprints

Designing for printability

Online designs created for other printers

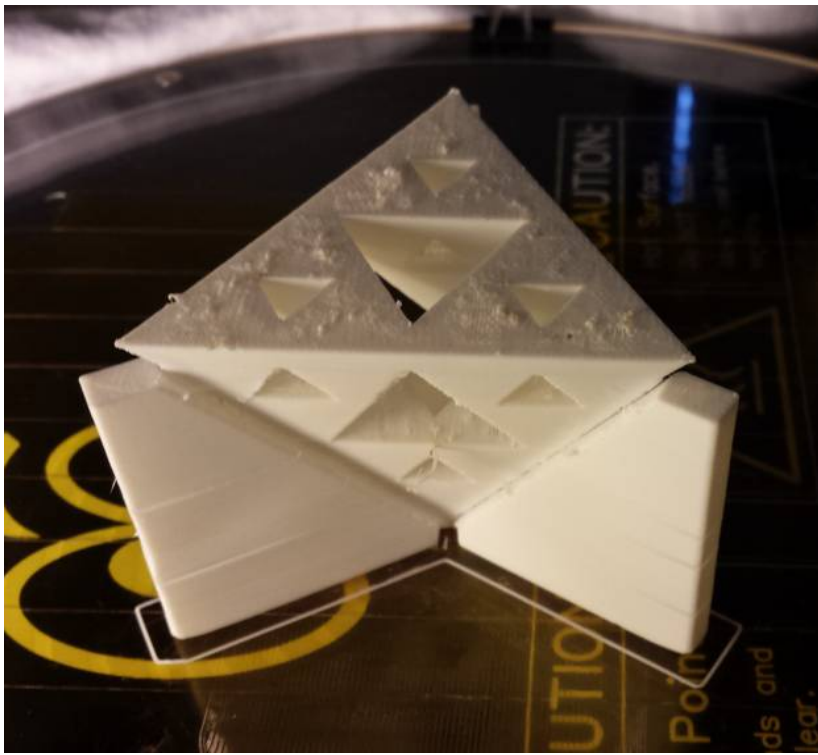
LOTS of experimentation / fine-tuning

Capabilities

Overhangs

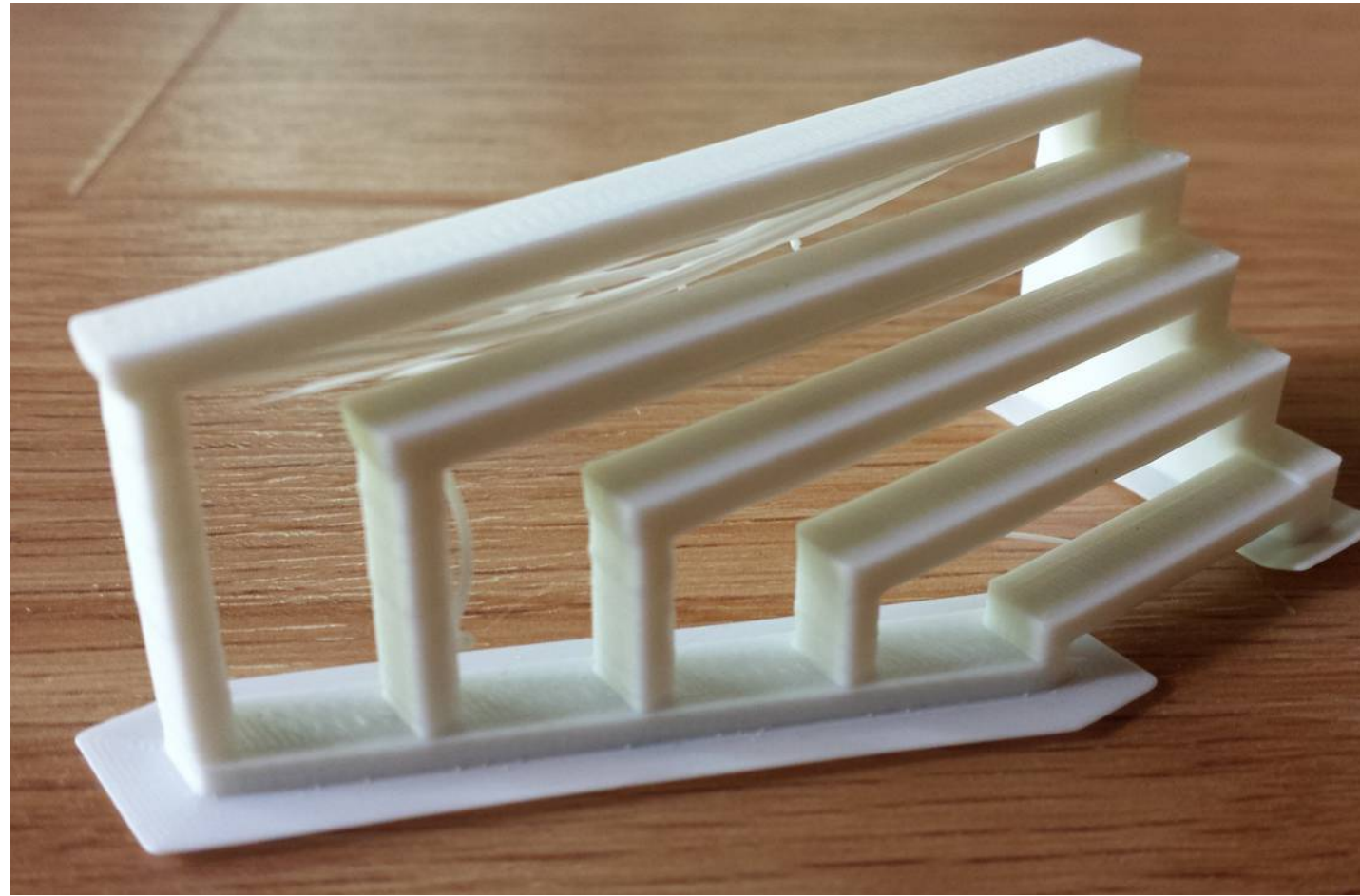


Support



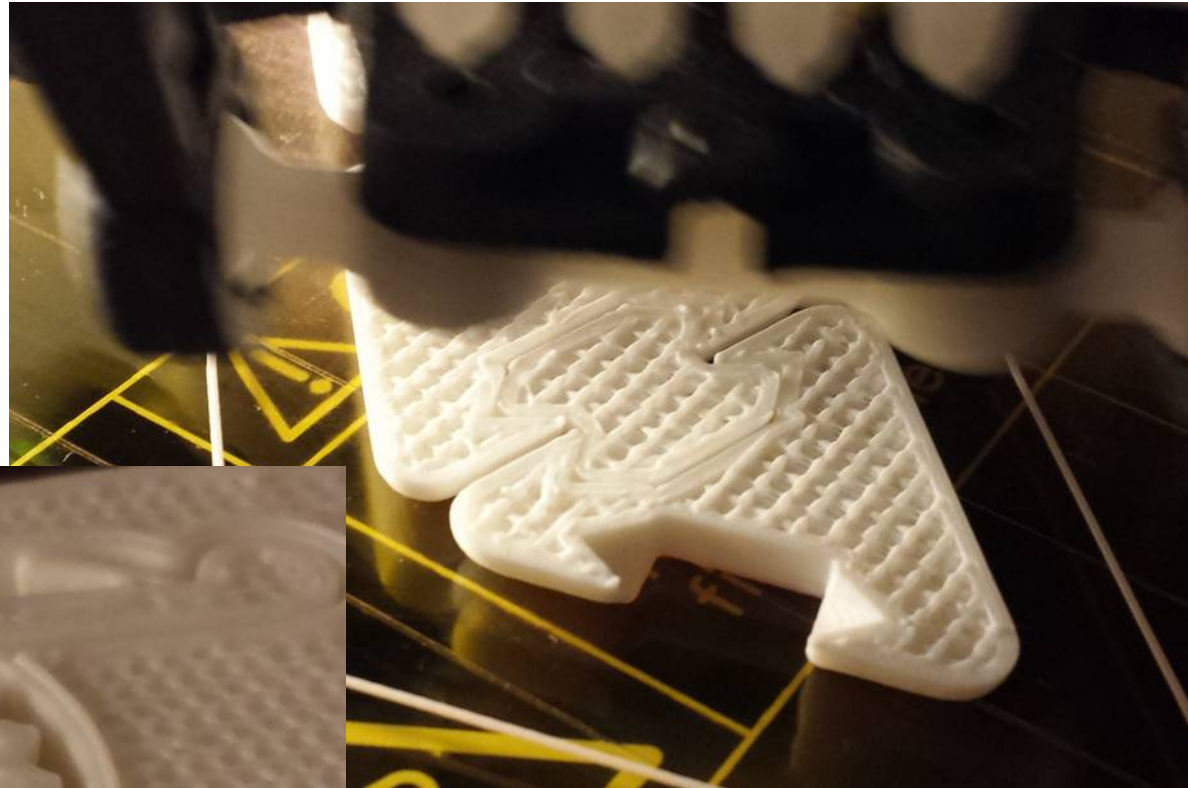
Capabilities

Bridging



Capabilities

Captured internal parts



Hinge

Ratchet gear

Capabilities

Print-in-place movable joints

