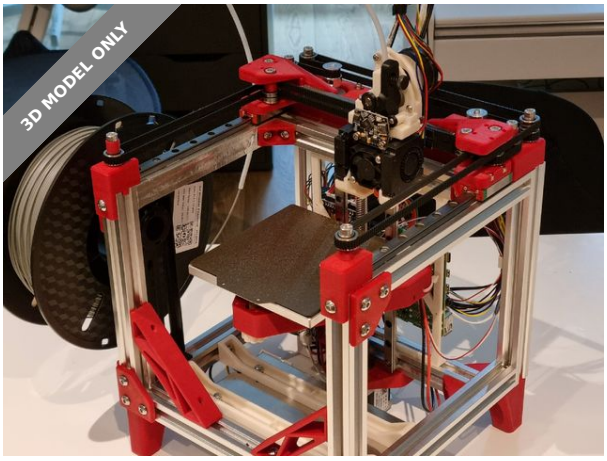


Caracal - v1.1

4D Spice

VIEW IN BROWSER

updated 14. 5. 2024 | published 14. 5. 2024

Summary

A fast, minimalist and modular CoreXY 3D printer that's easy to build and source parts for.

3D Printers > Other Printer Parts & Upgrades

Tags: 3dprinter corexy

A fast, minimalist and modular CoreXY 3D printer that is easy to build and source parts for with a build volume of 120mm x 120mm x 120mm (110mm Z with Volcano style hotends).

I needed a fast and small printer to rapidly print prototypes for my various projects that I could keep on my desk as I realised I printed frequently and printed small. The goal was to have the nice open front and flush sides of the V0 without the complexity and number of parts. It is similar in principle to Rolohaun's Rook 2020 but does not share any parts with either the V0 or Rook, everything was designed from the ground up.

Caracal rapidly became my workhorse and have been printing reliably ever since I completed the design.

It uses 2020 extrusions that are all the same length and Nema 17 stepper motors. The BOM is kept as minimal as possible and avoids the use of difficult to find parts and overall cost was kept as low as possible.

Parts are reinforced where they need to be and non structural parts are hollowed to save on print time and filament.

Some parts can be salvaged from other printers like an Ender 3 to further minimise costs. The printer can easily be enclosed if built using blind joints as all sides are completely flush without brackets.

Caracal is not fully reprap but all parts will fit a bed as small as a 180x180mm so printers like a KP3S or Prusa Mini would work just fine. The bottom PSU braces will need to be oriented diagonally to fit the bed.

Whilst the frame is rigid (see input shaper results below), I didn't push much past beyond 50k acceleration at 250mm/s for practical reasons. Below is the benchy printed at that speed. I'm sure you can push way beyond this without much issues with proper tweaks.

Watch the 10min Benchy

13/09/23 Update V1.1:

Changes:

- Updated X carriage plate to prevent belt slip during install
- Updated leadscrew clearance for larger motor couplers
- Reworked internal corner brackets for strength
- Reworked Z endstop mount
- Improved Bed Mount stiffness

Added:

- Wide feet for extreme speed printing
- .step files

Todo:

- Bambulab and Creality style hotend mounts for Superfang
- Volcano length duct

Also this is still a relatively new design and while I did test all the parts myself, it's still the work and experience of a single person, if for some reason something doesn't work on your setup please report it here on github

Print settings

- 0.2mm layer height
- 0.4mm line width
- 3 walls,
- 3 tops/bottoms,

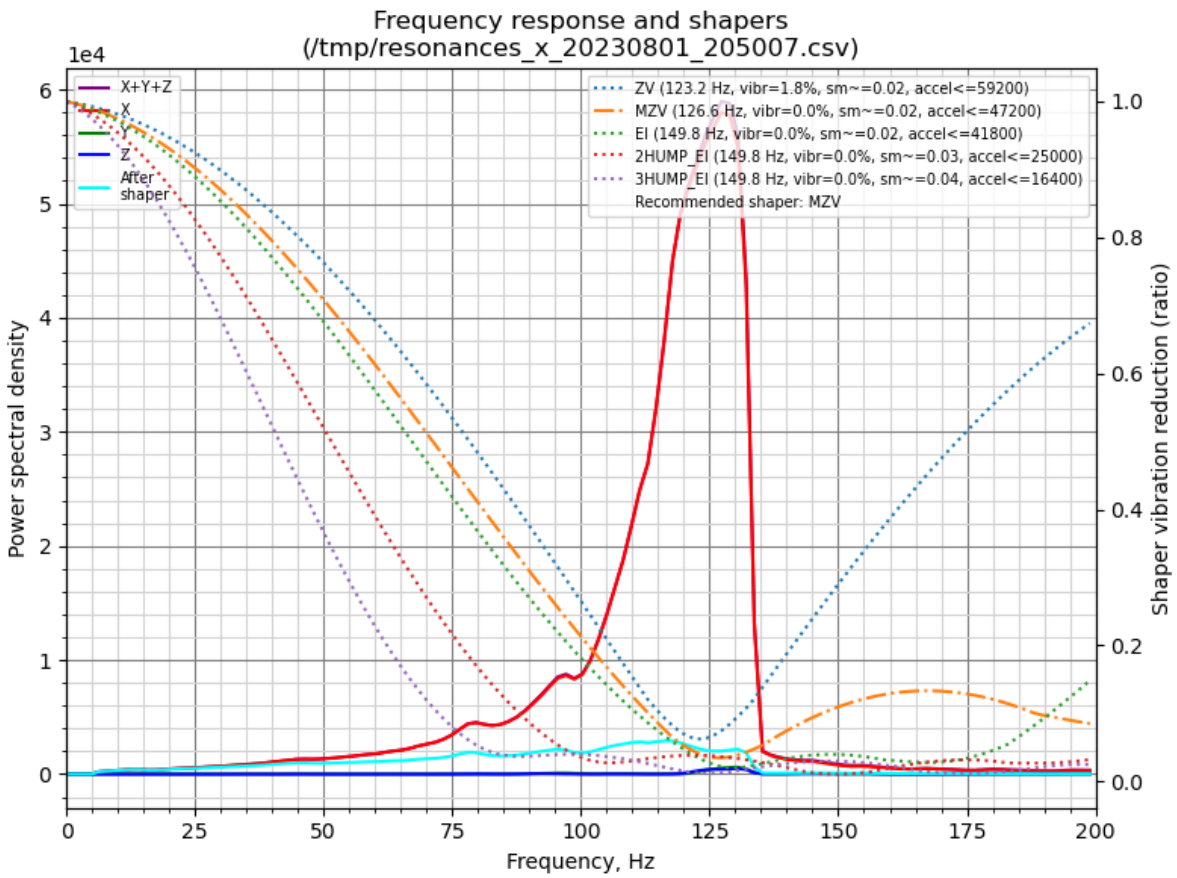
- 15% infill (cubic)
- PLA for open air, ABS/ASA for enclosed builds (#000 was built in ABS)

Klipper Config:

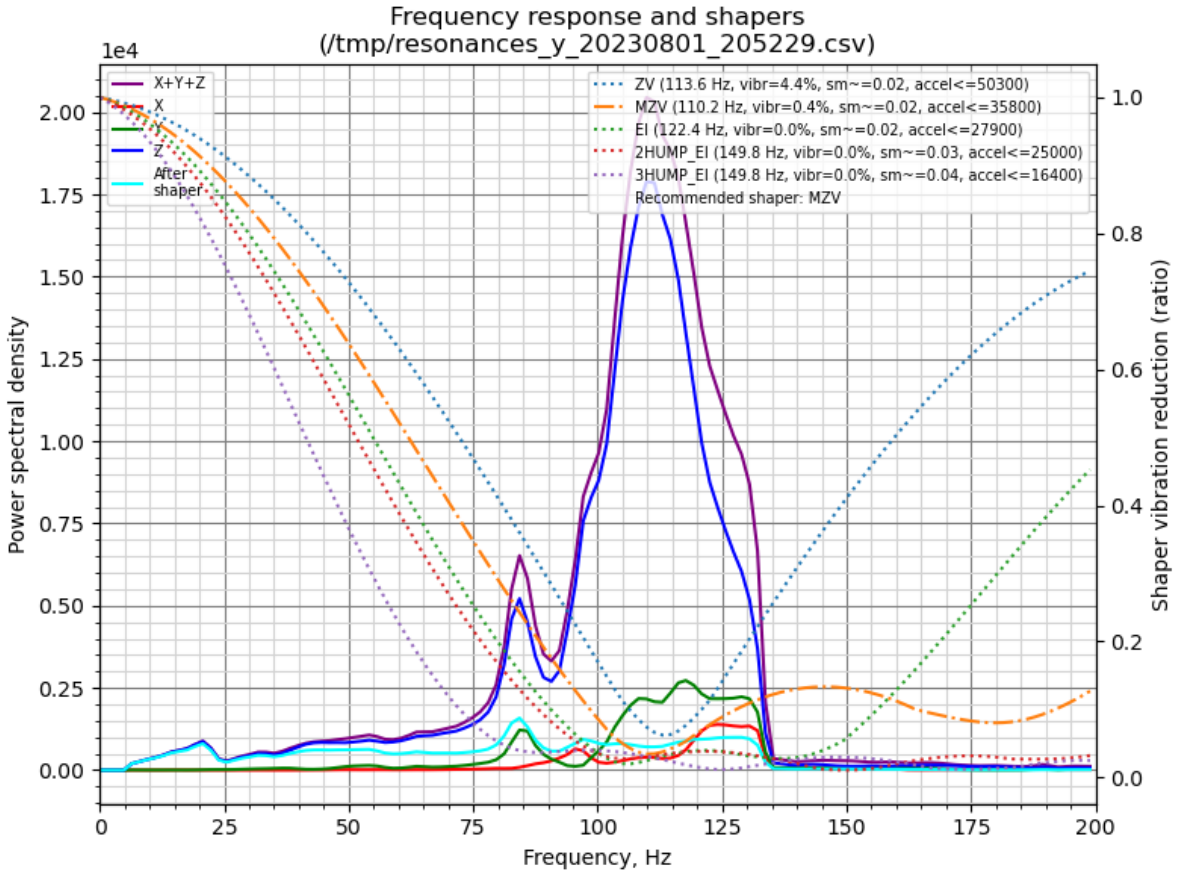
https://github.com/4dspice/Caracal/blob/main/Config/Klipper/printer.cfg

Input Shaping samples (Bowden)

X axis:



Y axis:



BOM

https://docs.google.com/spreadsheets/d/1f__scBLHZBergLk1_uNWVnCNQPU6N8hWUedBBvM0iNw/edit#gid=0

YouTube

https://youtube.com/@4dspice

DiscordServer

https://discord.gg/pxpvCewKF5

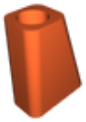
Model files

Frame 8 files

front-brace.stl

internal-corner.stl

corner-bracket.stl



foot.stl

foot-power-socket.stl

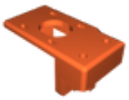
psu-mounting-rail.stl

skr-pico-mount.stl

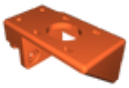
raspberry-pi-model-b-mount.stl

Gantry 5 files

corner-idler.stl



motor-mount-a.stl



motor-mount-b.stl

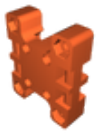
y-carriage-b.stl

y-carriage-a.stl

Toolhead 3 files

v6-duct.stl

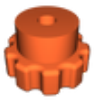
v6-sherpa-mini-fan-shroud-direct-drive.stl



x-carriage-plate.stl

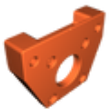
Z Assembly 4 files

bed.stl



knob.stl

endstop-mount-creality-style.stl



z-motor-mount-lead-screw.stl

caracal-v11.step

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