

Micro V2

Design Prompt: Build a V2, using v0 Components :-)

Why? Why not.

Actual reasons:

- Fun way to screw around and make a V0 more interesting
- Better Z and bed leveling: self-leveling, no leadscrews to wobble or source, and avoids cantilevered bed mounting
- Cheap way to see what a V2 is like from a software side

Design goals

- Use as much V0.1 stuff as possible:
 - Toolhead (extruder + hotend): V0.1 Mini-AB
 - XY Drive: F623ZZ bearings, GT2 belt, 20t pulleys, NEMA14 motors
 - Motion: MGN7H 150mm rails and carriages
 - Frame: something like 200mm 1515 (see below)
 - Bed: 120x120
 - Tophat?
- Use as much V2.4 (scaled-down) as possible:
 - Idler design?
- Printability
 - Zruncho: Printability on a v0 should be a bonus but ideally not required. It just makes things more complicated if you have to split stuff up.
- Exist quickly and be fun to build

Expected additional BOM costs (~100 only)

- 2x additional 150mm rails and carriages
- 3x extra motor drivers + a board to handle them
- 3x endstop switches
- 4x pulleys + belt

History

Kicked off by Hartk1213, Apr 30 2021 as seen in #voronuser_mods and other Voron channels:

<https://discord.com/channels/460117602945990666/635687829254701107/837819803241545769>

Credit to Hartk1213 for this render:



A tiny 120x120x on May 1 2021 is also relevant: [Voron 2.4 Zero 120er](#)

<https://discord.com/channels/460117602945990666/624317225540780055/838019750960562217>



Also, an older one: V2.4 "the mini":

[Voron 2.4 „the Mini“ 150x150x120 Serial Request](#)

[Voron 2.4 „the Mini“ 150x150x120 Serial Request](#)
youtube.com



Open preview

— Dies war mein Serial Request zum Voron 2.4 "Mini" mit 150mmx150mm Druckfläche. Er hat erfolgrei...

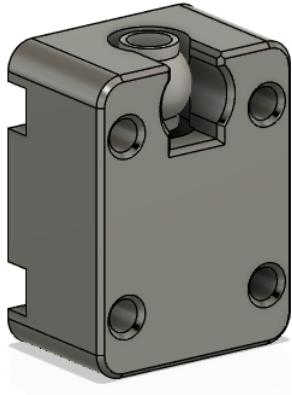
Major Design Questions

Frame Design

What to do with extrusions and frame design in general?

- (1) Strictly stay with unmod V0 extrusion kit (16x 200mm 1515)?
 - May need some corner brackets; can't do this without making corner brackets (plastic or metal) of some kind
- (2) Start from V0 extrusions, but chop some?
 - Could use fully blind-jointed frame, but chop Y extrusions on carriage to fit space for rails.
- (3) Add longer 1515 extrusions?

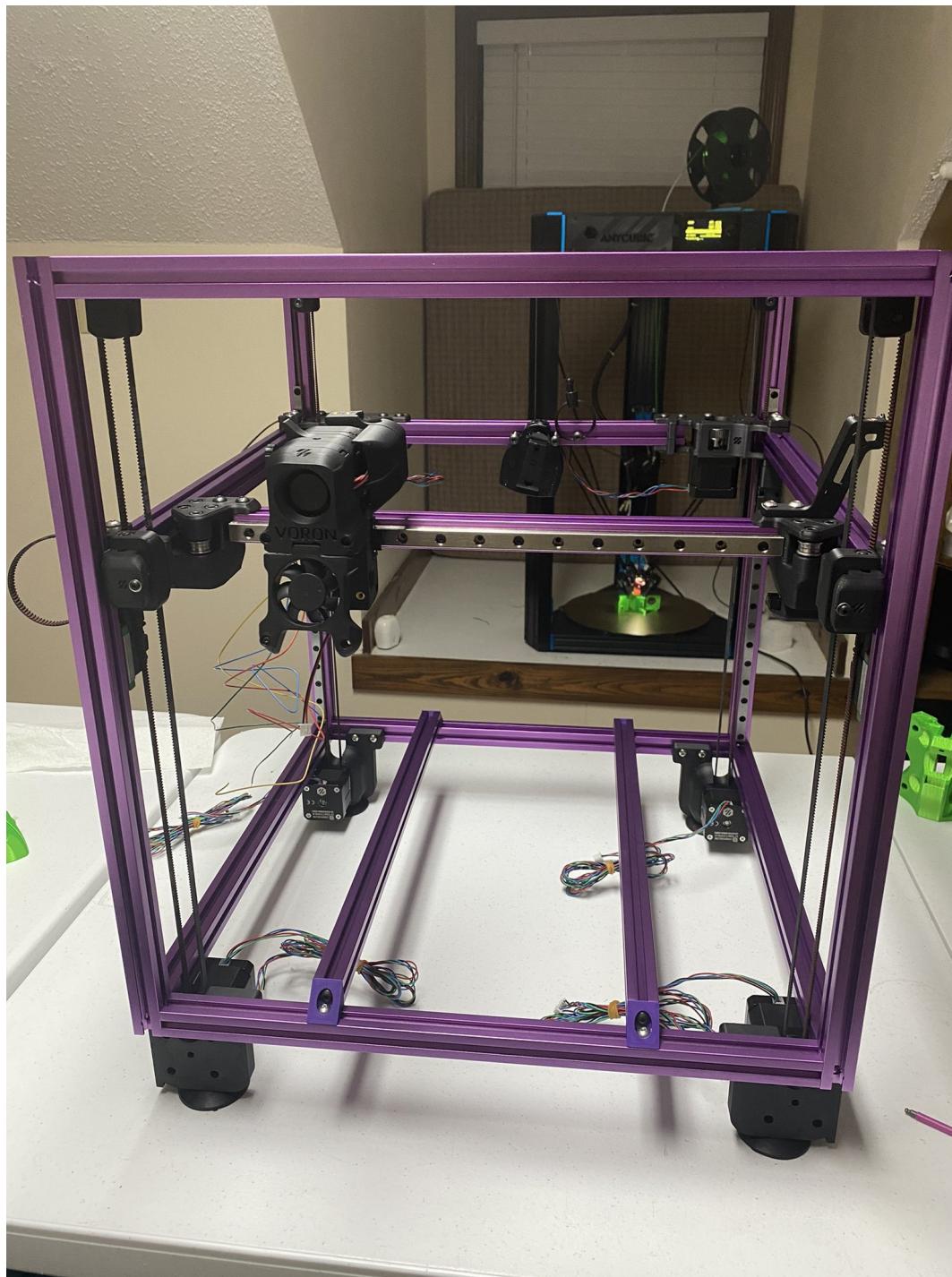
Spherical Joints?



<https://discord.com/channels/460117602945990666/788492188099149855/837973995444764724>

Drive Design

- **NEMA17 or NEMA14?**
 - Zruncho says: I have tons of leftover NEMA17s. These might work with DD, given that the gantry is relatively lightweight, and with higher holding torque, should have no problem staying up. On my second V0 w/thefpvgeek's belted z, it does drop occasionally, but it doesn't seem to matter. Also have 4 spare NEMA14s I could use for this (old RobotDigg ones) - not like the Z motion is the challenging part here.
- **Direct drive or not?**
 - Josh Murrah Direct Drive Z on 2.4 example:
 - <https://www.youtube.com/watch?v=33vp0lmmG6s>
 - <https://twitter.com/JoshMurrah/status/1336305645914558466/photo/1>



Bed Probe

- ?
- Euclid?

Enclosure Design

- MGN7H carriages are 17mm width, so they stick out 1mm on the sides. You can't just reuse the V0 enclosure parts without mods, if the rails are mounted similarly to the V2.
 - Use 1.5mm shim prints?
 - Use reasonably rigid adhesive-backed foam to bridge the gap?
- Doom it with quad-1515 extrusions? Do these exist?

- Use printed holders with a Reflectix sandwich?

Tophat, Doom style, or other?

- V0 electronics fill up a ton of space already.
- Turn an existing tophat into an electronics space?

Umbilical or Wire Chains

- Zruncho says: V0 is umbilical, so stick w/umbilical if possible, except for Z motion. Especially when you're down to 4 or 5 wires with a CAN toolhead, the fat bundle goes away and the umbilical works fine.

Minor Design Questions

Skirts

- What style?
 - Zruncho & Hartk have both done custom skirts. They're not that hard.

Screen

- What style?
 - Zruncho says: having a KlipperScreen is pretty nice, but keeping the existing micro display as an option makes sense, especially with LDO selling these now.

FAQ

Why? Why not.

Why not a v1 then? Leadscrews. Fun.

But isn't there a belted v0 mod already that ditches leadscrew? Yes.

Aren't T8x8 leadscrews, especially integrated ones with V0.1, just fine? Yes.

What are the downsides?

- Cost of additional components: 3x additional motor drivers + board + belts + pulleys + endstops
- Additional build time for each Z drive