Voron Design

Uneven First Layers

How to test that your build plate is level while troubleshooting issues with first layers.

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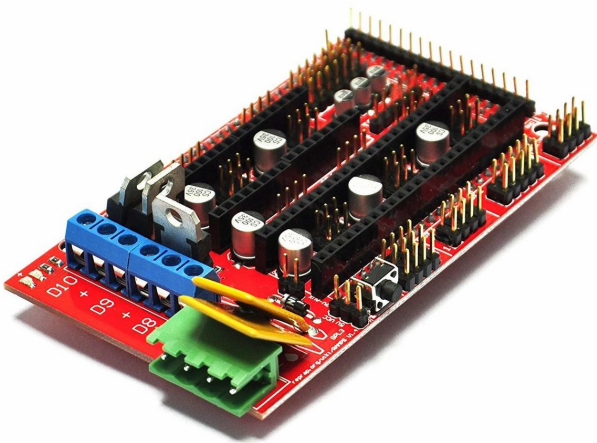## 🔧 TOOLS:

- Bondhus Balldrivers (1)
- Precision Screwdriver Set (1)

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Step 1 — Lower Your Acceleration

```
# max_z_velocity: 25
max_z_velocity: 15
```

- Open your **printer.cfg** file

- Find the **[printer]** section and modify **max_z_velocity: 25** to **max_z_velocity: 15**

- Issue a **firmware_restart** in the OctoPrint terminal.

Step 2 — Verify VREF

- If using a ramps board, ensure the VREF of your Z stepper drivers is set to .98V

⚠ You must have active cooling on your stepper drivers, or you may have issues with missed steps.

- If using an SKR with 2209 drivers, set your UART current to 1.0

Step 3 — Set Equal Z Belt Tension

- Decide on one Z belt for your reference. Tension it by feel to where you want it. These can be a bit tighter than your XY belts, but you don't have to go crazy.

- Pluck the outer belt as a sound reference.

- Set the remaining 3 belts using this tone as a reference. Come back to it often, plucking the reference belt and checking the remaining 3 belts, adjusting as required.

- Ensure all retaining bolts are secured.

Step 4 — Re-seat Your Heated Bed
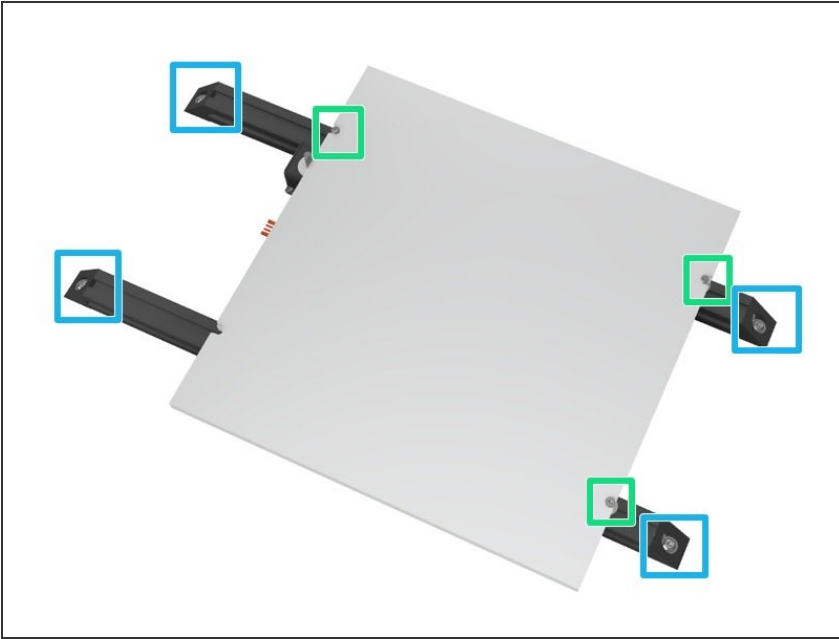
- Loosen but do not remove the 3 M3 bolts holding your bed down.

- Loosen but do not remove the 8 bolts that hold the OpenBuilds corner brackets to the extrusions.

- Heat your bed to 105C for 30 minutes.

- Carefully lift and drop the build plate to seat the extrusions. 3 or 4 times is more than adequate.

- Tighten the build plate M3 screws while still hot.

- Tighten the bolts that hold the OpenBuilds corner brackets to the extrusions.

Step 5 — Check Gantry is Square

- With the motors off, move the gantry all the way forward so the extrusions hit the front idlers.

- Check each side to make sure there is no play between the idler and the extrusion. You should not be able to pinch either side and have it move.

- If one side does have play in it, tighten the belts on the same side front idler.

- Move the gantry all the way to the rear, and all the way forward again. Recheck the gap and adjust as required until the gantry hits both idlers equally.

Step 6 — Print a Visual Method Test
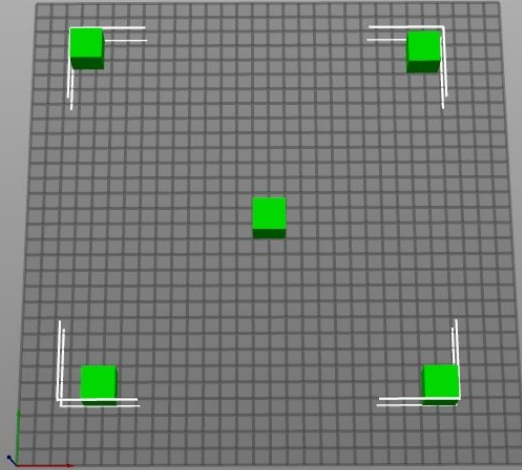
- Start by printing a 5 cube grid. You can download the Visual Method Cube here.

- Arrange the cubes as per the help image. You want a center cube, and one on each of the 4 corners.

- Print this test using the first cube as a first layer reference. You can adjust your layer height until that center cube prints the way you want it, and then continue to allow the other 4 to print to verify if your machine is now printing properly.

Step 7 — Seek Non-Professional Help

- If this guide wasn't enough to get you printing, check the community Discord and ask in #voron_v2_build-help

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