

## V02 Siboor Kit Review

By Greg's Maker Corner

Siboor Review: <https://www.youtube.com/watch?v=cOtdasw3uVo>

Twitter: <https://twitter.com/greghuber>

Scorecard:

If I were to grade the overall kit, relative to other kits I've had experience with, here is how I'd grade it, on a 1-5 scale. 1 being terrible, 5 being amazing/great.

Overall Kit Value - 4 / 5 rating. I would recommend this kit, but please understand the tradeoffs as mentioned below. Have proper expectations- there may be a few minor issues or things you need to address during the build. If you go into it with that mind set, you will enjoy this kit. If you are expecting "perfect" you will not find it at this price point. Based on my experiences, I believe Siboor will help but keep in mind your build may be on hold if you need any replacements.

**Overall Quality of Kit** - 4/5 rating. There is room to improve based on the issues I ran into, but for a sub \$500 kit I feel it is a good value and recommend it, but make sure you understand some of the tradeoffs so your expectations are realistic. It would be a GREAT value if quality control was improved and a few minor adjustments could be made.

- **Comprehensiveness of Kit** - 4.5 - Includes just about everything needed. You can get started building as soon as the kit arrives.
- **Quality of Printed Parts** - 4 - I only had two reprint two parts, 1 was warped, and one cracked during install (door handle).
- **Quality of Motors** - 4.5 - Moons pancake motor, Siboor/Generic AB motors- seem adequate (but unbranded).
- **Quality of Belts** - 5 - Genuine Gates Belts
- **Quality of Fasteners** - 4.5 - Stainless fasteners, all good. I had only one bad fastener (bad threads) out of the entire kit.
- **Quality of Rails** - 4.5 - Rails are good after replacement, initial rails were rusted in the channels. My understanding is that Siboor is addressing this for all future kits. The rail carriages have no perceptible wobble, but I'd prefer a Z1 preload for the X rail.
- **Quality of Extrusions** - 4/5 - Good quality, cut well, but the extrusion profile makes it near impossible to use with the popular hex nut no drop nut mods. The included PCB's nut carriers are not ideal, as they easily strip/break after repeated tightening. I recommend getting square nuts and using my no drop nut mod and nut carrier remix.
- **Quality of BondTech Gears** - 3 - I had to replace the larger gear due to the press fit bearing. The needle bearings and other parts were adequate.
- **Quality of Hot End** - 2 - My hot end had metal shavings in it, so I did not use it. I would like to see a better hot end provided, like a Dragon, Dragon Fly or e3d Revo. However, that is unlikely at this price point.
- **Quality of Fans** - 3.5 - Part fans are quiet and seem to work OK. I had a bad 3010 fan with a bad bearing that was very noisy. I did not use it, but there was a spare.
- **Quality of Heated Bed** - 4 - Bed works fine, takes about 10 minutes to get to 100C.

- **Quality of Voron Display** - 4 - Screen works fine, but I had to manually align it, as it was slightly angled.
- **Quality of Acrylic Panels** - 5 - Panels are great, laser cut very well with no scratches
- **Quality of wires and crimps** - 4.5 - All wires had good quality crimp. AC inlet wiring could be a bit heavier gauge but is adequate, all other wires had appropriate gauges. The AC Inlet wire color is not standard IEC/American colors. A "Y" connector for parts fans should be included (I had to crimp my own).
- **Amount of Fasteners/Spares** - 2 - I was short 2 shims and 9 M3x10 screws. This should be addressed, and would be frustrating for new builders. Luckily I had plenty of spares from other projects. Beyond that, I had sufficient quantity.
- **Quality of Support** - 4 - The discord was helpful, but isn't as active as the Voron 0 discord where most folks will be asking, and will be looking for help during US hours (if building in the US). Replacement rails were also shipped out quickly.
- **Wiring Documentation** - 4 - The included wiring diagram was really helpful. I would like to see it include pin #'s on the Gemini Fly board.
- **Ease of Setup with Klipper** - 5 - Klipper comes pre-installed, and is already set up in the printer.cfg for both the MCU and V0 Display. Sensorless homing values were also set up and worked well. I ended up changing the printer.cfg fairly significantly, along with macros, etc. but this was simply my preference.
- **Gemini Fly Board** - 4.5 - The Gemini Fly is a bit different than the stock SKR Pico and Raspberry Pi. The image was pre-installed and for the most part worked fine. It was set up for Fluid out of the box, I switched it to Mainsail which was very easy. The pre-installed image also did not include a DNS library package to resolve it's hostname over the network, so I had to connect to it via IP address initially. I asked for help in the Siboor discord and added the necessary package.

## Build Log:

### Extrusions / Nut Holders

- When I first started the build, I planned on using M3 no drop Nut Holders, which I have used on several other Voron 0 builds. Unfortunately I ran into an issue- none of the existing no drop nut mods available online worked.

#### Nut Holders

- Background: 3d printed m2 Nut Holders, used to secure the rails to the extrusions, were not included in my build. Instead, there was a small PCB board that was intended for this purpose.
- This board will easily break if too much torque is applied, and it may not last long over repeated tightening. Furthermore, this does not follow the instructions of the Voron 0.2 manual and builders may perceive it as cutting corners or a quality issue.
- **Recommendation:** I made a simple remix of the Voron 0.2 nut holders that will work in the Siboor V02 extrusions. They are simple prints. I suggest to print 5 of these parts and include them with the kit instead of the PCB's.

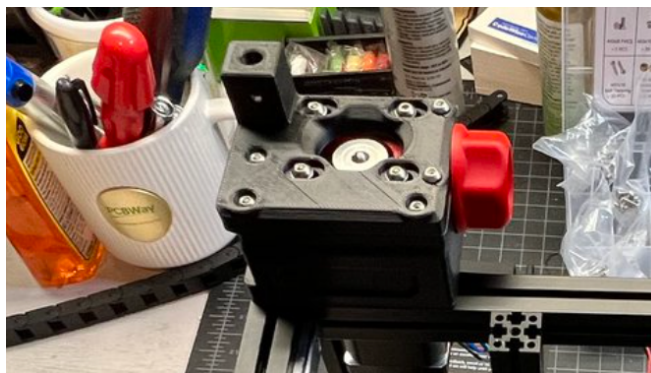
[https://github.com/VoronDesign/Voron-0/blob/Voron0.1/STLs/M2\\_Nut\\_Adapter\\_Rotated\\_x5.stl](https://github.com/VoronDesign/Voron-0/blob/Voron0.1/STLs/M2_Nut_Adapter_Rotated_x5.stl)

### M3 No Drop Nut Mod

- **Background:** Most builders will struggle with pre-loading of nuts. While it is not part of the official Voron 0.2 build, it is always recommended to use the "no drop nut" 3d printed parts to significantly improve the build experience. Otherwise, nuts will drop and fall out during the installation process which can cause a lot of frustration.
- The Siboor aluminum extrusions have a much smaller profile than other extrusions (LDO, MakerBeam XL, Misumi, etc.). That means the existing "no drop nut" designs will not fit. I went ahead and remixed a few designs. Unfortunately, the hex nuts provided by the Siboor kit are too thick to allow for consistent use of no drop nuts. I measured them to be anywhere from 2-2.2mm thickness. The printed part needs at least .2mm of plastic, so in some cases the no drop nuts are physically impossible to install into the extrusion.
- More information, along with my customized part here:  
[https://github.com/techyg/Voron0Stuff/blob/main/SiboorV02kit/Siboor\\_V02\\_HexNut\\_1515.stl](https://github.com/techyg/Voron0Stuff/blob/main/SiboorV02kit/Siboor_V02_HexNut_1515.stl)
- **Recommendation:** The best solution is to provide DIN 562 square nuts, which have a nominal thickness of 1.8mm. These will work consistently with the "no drop nuts" modification. You may want to 3d print around 60-70 of these parts- they are very small parts and should not take much filament.

### Medium Importance

- Some parts, like the top of the A and B motors had some minor surface quality defects and appeared slightly over extruded.
- **Recommendation:** For all print farm printers, calibrating the top layer extrusion multiplier (EM) should help address this issue. This should be a fairly easy fix. There should be no gaps or gashes on the top layer.



### Less important but will help with quality:

- **Rails Stopper**
  - **Background:** The rails do not include "stoppers" on the end of them in the package. This means that the rail carriages could come off while the builder is installing them. This is unlikely to happen since there is a good preload, but it is possible. I also noticed 1 small ball bearing in one of my rail packages. This probably isn't a significant issue but it appears that one of the ball bearings had fallen out.

- **Recommendation:** Install a small rubber "stopper" on both ends of the rail before the packaging step.
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- **Rail Cutting**
  - The rails were not cut flush (flat) on the ends. In some cases, the end of the rail was slightly rounded. This is not a significant issue but it doesn't look as professional, and builders may notice this and think that the quality is not as good as it should be. Fortunately, the rail channels were still good and did not seem to be impacted.
  - **Recommendation:** The tools used to cut the rails may need to be improved to ensure a flush (flat) cut.

#### Critical Issues:

- **Rusty Rail** issue- discovered rust in rail channels after I completed my build. I reported this to Siboor and new replacement rails were sent. The new set of rails seems to be good quality, and also included rail stoppers as mentioned above. I was informed all kits will address this issue, and a few others independently who had purchased this kit (that are not Youtubers/Influencers) received replacement rails of good quality.
- **Washers/shims**- there were not enough included. I was short by 2 washers, and ran out when I got to the step where I had to mount the springs on the bed. Fortunately, the washers are not critical here, but are recommended. Please include at least 5 more washers.
- **Bondtech Gear** - the bearing was press fit onto the large gear. It may be removable with tools and patience, but I wasn't willing to risk damaging the bearing. I used a spare genuine bondtech gear that I had. The 3d printed jig to sand was also not included, and is needed for proper install/assembly. I recommend getting a different clone part that does not have a bearing pressed onto the end of it.
  - Include 3d printed circular jig for sanding
  - Do not press fit bearing on end
  - Reduce # of small bearings included in kit to quantity of 2 (currently includes 3)



Printed Parts- I ran into a warped part (the shuttle piece). This piece should be flat on the top and bottom, it was warped on the top as shown in the picture. I was able to reprint this easily. It would be a good idea for Siboor to include approximately some sample filament (100g?) just in case parts need to be re-printed.



Metal shavings found in the hot end - nozzle was on too tight to do anything to clear it out.

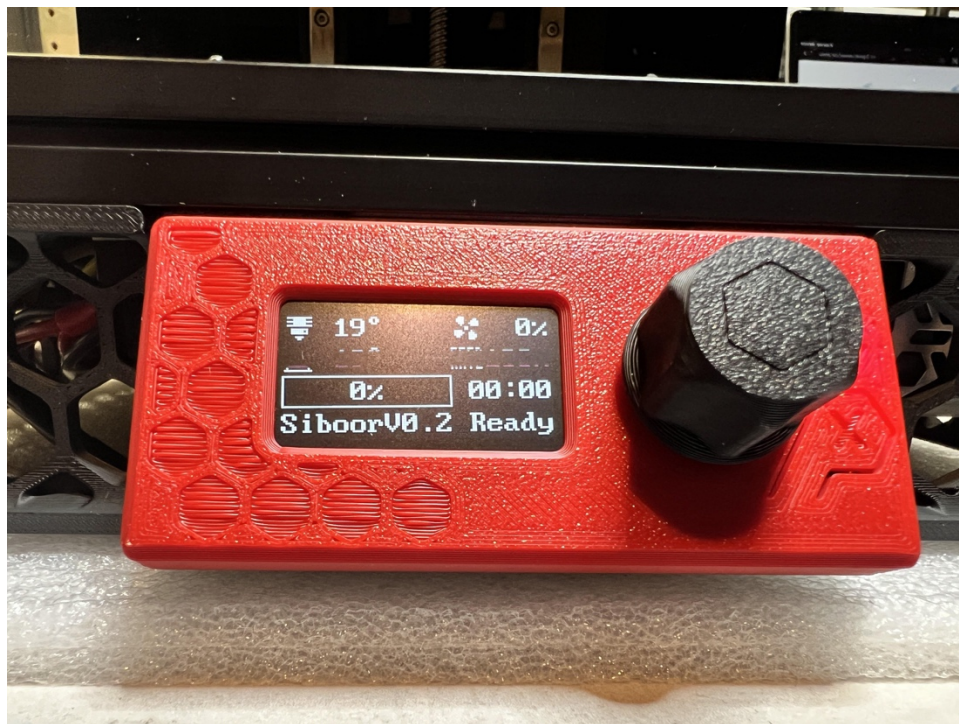




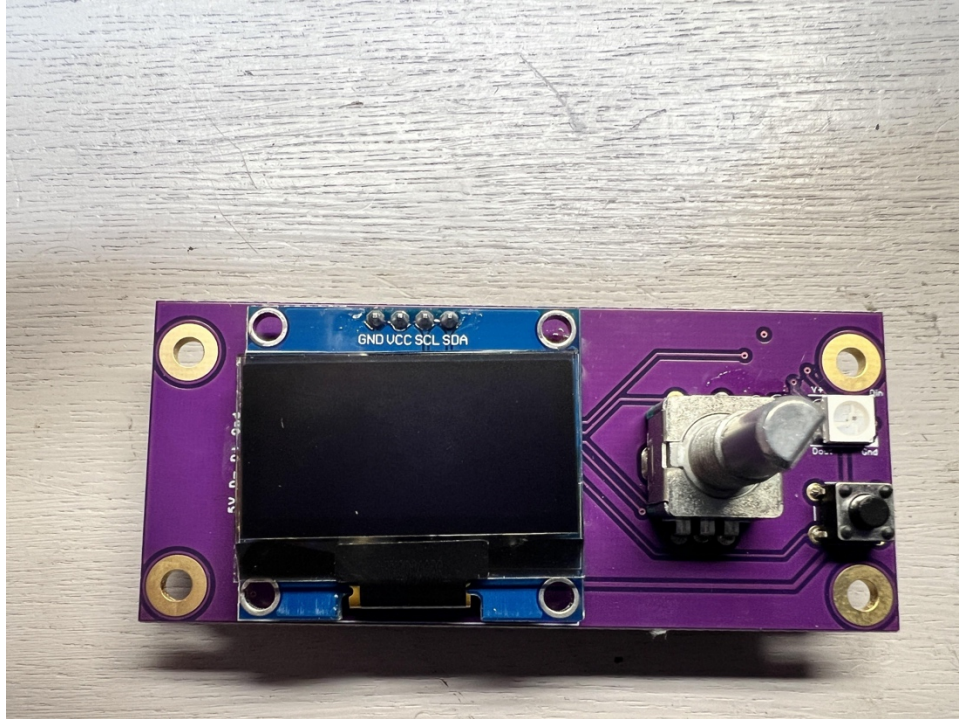
I don't plan on using the included hot end because of the metal shavings. It makes me suspect the hot end may not be high enough quality, and will cause jams and problems. I have a spare dragon fly hot end and will just use that. I think it be good to revisit the hot end and double check the quality.

### Wiring and Klipper config

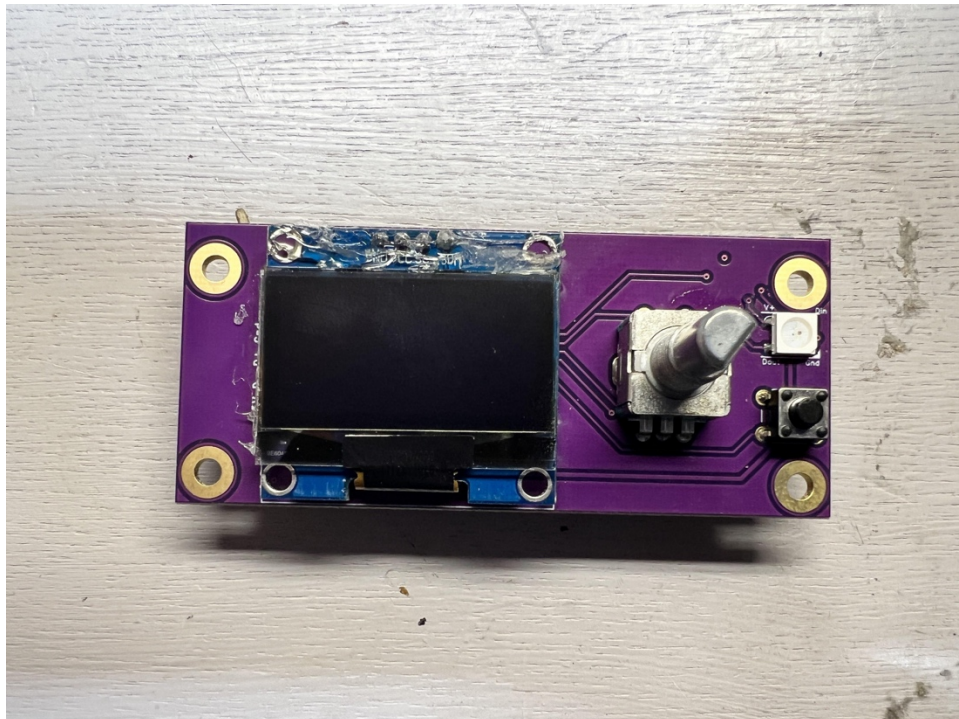
- The provided wiring diagram was really good. It would be good to add pin names to this diagram for more clarity.
- **Wiring:** all wiring was crimped well. I didn't have any loose connections. Some crimps (JST XH, motor wires) had a little too much wire that protruded past the crimping point, but it's not a problem and didn't interfere with the connection.
- **AC Power Inlet Wiring** - the wiring was a little small of gauge but should be sufficient. I would increase the gauge to the next size up. (18 AWG would be ideal).
- The **standoffs** will hold the Gemini Fly control board, and require screws on the back panel, from the front side. The screws on the left side are fine, but on the right side they interfere with the cable chain. One solution is to sand down or grind the top of the screw so that it does not make contact with the cable chain.
- The Voron 0 display had an angled screen on it. I was able to adjust it and used hot glue to hold it in place so it would be at the proper orientation. An improvement for the factory would be to double check these are glued properly.



The screen on the PCB was glued at an angle:



After fix: (Manually manipulating screen, and applying hot glue to hold screen square):







#### Control Board:

- The included Gemini Fly v3 is a great budget alternative to using a Raspberry Pi (\$100+) and SKR Pico (\$40). It includes both the "compute" (Pi) and the mcu to control the printer. An SD Card was included with Klipper preinstalled (more on this later).
- Terminal connectors for power inputs are very good and possibly over spec'd.
- Screw terminal connectors for heater is good.
- Downsides:
  - It only has 2 PWM controllable fan ports, which isn't quite enough if you want to control 3 fans (which is the stock Voron 0.2 configuration).
  - It doesn't include neopixel pins like the BTT boards.
- Fortunately, the Gemini Fly does support CANBus and a toolhead board such as the BTT EB 36 or Mellow Fly SHT36 v2 is very cheap (around \$20). These CANBus boards will provide additional extruder connection, part and cooling fan connectors, a neopixel connector etc. which will free up the Gemini Fly connections. Additional wiring, configuration and compiling work will need to happen to go this route.
- The image included both Mainsail and Fluid. I prefer mainsail, it was easy to switch over. I found this to be a good resource to help with config. This was for the gemini v2 but much of it is very similar for the v3:
- [https://teamgloomy.github.io/fly\\_gemini\\_v2\\_general.html](https://teamgloomy.github.io/fly_gemini_v2_general.html)
- By default, the image does not include the ability to resolve hostname over DNS.
  - Fix: Thanks to RichardTHF in Siboor discord.
  - Run the following command while connected via SSH: **sudo apt install libnss-mdns**



#### Fans:

- The connector for the hot end fan was too short. I had to make an extension cable.
- No Y connector for part fans was included.
- Fan cooling airflow seems weak with the stock fans. They seem to move less air than the GDSTime brand of fans that I have installed on my other Voron 0. Printing PLA/TPU with small features/overhangs may be problematic, but I did not observe issues printing the Voron test cube.
- My 3010 301fan for board cooling was very loud/must have had a bad bearing. It was not usable. I replaced the fan with a spare GDSTime fan I had laying around.
- The Siboor default layout of the printer.cfg recommends having the hot end fan "Always on". I think it would be better to use a temperature-controlled fan (based on hot end temp). This is how the stock voron printers should be set up. The board cooling fan should be controlled by the "always on" voltage pins. I merged my preferences into the printer.cfg and will post this to my github location.
- The fans are OK for a budget builder. For most user I would recommend replacing the fans with Delta or Sunon.

#### Bed heater:

- I had to apply the heater myself. No RTV was included to help maintain adhesion of the bed heater, but I don't anticipate this is an issue.
- Bed heater definitely needs a PID tune, the stock PID's did not hold temps accurately.
- It takes about 10 minutes to get to 100C where I have my printer (20C ambient temps). This is acceptable.

#### Hot End:

- The hot end has a ceramic heater and v6 nozzle. It appears to be of poor quality. Metal shavings were found in my hot end, and I could not easily remove them. The v6 nozzle could not be loosened cold.
- The hot end uses the included Dragon mount.
- The original hot end in my kit was known to have a quality issue with the thermistor being unreliable, so Siboor sent a replacement along with my rails. The original hot end did not have metal shavings, but the replacement (that fixed thermistor readings) did.
- Because of quality concerns, I decided to use a spare Dragonfly hot end instead. This hot end replacement costs around \$50 but is very reliable and worth it.
- I would not recommend using the provided hot end for these reasons, but it may be adequate.

#### Motors:

- I used the same wiring color for the motor wiring.
- I had to reverse both X and Y in the printer.cfg as they were homing the wrong distance.
- Sensorless homing defaults in the included printer.cfg worked well and I did not have to change them.
- The motors appear to work fine and I have no complaints.

#### Panels and Top Hat Install

- The assembly went well generally speaking, with the exception of the door handle.
- The door handle cracked while inserting the magnets. I re-printed this part with my own roll of eSun ABS+ and they fit perfectly, snugly but not too tight where I had to press in hard as with

the Siboor printed parts. I believe the 3d printed parts for the door handle were a bit too over extruded.



- Acrylic looked good and was nice
- I ran out of m3 x 10's for the top hat. I only had one spare, and needed 9 additional screws.

### **Overall Impressions / Summary**

Things I really like about the kit:

- The packing of the box
- 3d printed parts included and overall good quality. I only had to reprint a few parts.
- Pre-crimped wiring was well done and I only had to crimp a few things, such as a y connector for part cooling fans.
- Wire diagram was very good and helpful.
- Black Acrylic panels look nice.
- The quality of acrylic panels / laser cutting is very good.
- Klipper was pre-configured and installed on the SD Card, so no compiling of firmware was required. The device ID was also pre-populated in the printer.cfg file.

Things that I found to be odd, but are OK:

- The extrusions were not compatible with existing no drop nut mods, and nut carriers. But with some modification to these parts, and use of different nuts it wasn't a problem. You may want to include instructions for users to know this, and that there are mods available.

- Wire color of AC Inlet does not conform to IEC or American standards. This is mentioned on page 196 of the manual. The wiring diagram pointed out the proper colors, but you may want to consider changing wires to a color scheme of brown, blue and Green/Yellow (IEC) or a color scheme of Black, White, Green (America). The colors used were Red, Black and Yellow.

Potential opportunities to save / simplify the kit:

- Reduce Z motor cable length by half, it is quite long.
- Do not include a press-fit bearing on end of large bondtech gear. This interferes with sanding of the shaft, and removing it is very difficult/not possible. Only 2 bearings are needed.
- Split loom for the wiring was quite long. It could be reduced in half and still be enough for the build.
- Moons (extruder0 motor wiring length could be reduced by about 150mm.

Low-cost Opportunities to improve the kit:

- Include a small bag of 100g of red and black eSun ABS filament so if any print quality issues are encountered, the customer can re-print small parts without having to buy a full spool
- Include a sheet of 100 or 200 grit sand paper, which can be used for sanding the bondtech gear shaft, the bed pieces, and the heads of the m3 screws (where cable chain interfere)
- Reduce hex nut quantity by half, and add 100 DIN 562 square nuts
- Print 100 square nut no drop nuts
- Remove PCB inserts and replace with 3d printed nut carriers for square nuts (use my remix)

Here are ideas to make this kit work for advanced users who want the latest and greatest. I think you could offer this as "Advanced Upgrade Kit for V0.2". If you can keep the cost under \$50 I think many people would be interested.

Strongly Recommended:

- Upgraded Hot End to something more mainstream, eg. Dragonfly, Revo, etc. (\$50)
- Provide a large genuine BondTech Gear (\$5-6)

Optional:

- Upgraded 3010 part cooling fans (GDStime, or Sunon/Delta) (\$20-\$30)
- Kirigami Bed that can replace the regular bed extrusions (\$20)
- CANBus Toolhead, like BTT EBB 36 v2 or Mellow Fly SHT36 v2. This would also have an impact on the wiring and crimping, but Canbus toolhead includes necessary connectors. (\$20)

**Conclusion:**

This kit includes just about everything needed to build a full Voron 0.2. For only \$469, it's a very well competitive kit, especially if you are OK with the tradeoffs. In my mind, the main concerns are the hot end and large Bondtech gear. The rails were also a problem initially due to rust, but those have been changed out and I think they are very good quality. For an additional \$50-60 (or about \$530), you can easily address those items and have a perfectly functional Voron 0.2.

Another advantage of the Siboor kit is that it really does simplify the Klipper install and configuration. Klipper comes pre-compiled, and the main thing you need to do is configure the wifi connection. The default printer configuration is pretty good but will probably need a few changes. However, for the most part everything is configured- including the sensorless homing, which will definitely save you time.

If you want a kit with better components that includes genuine Bondtech parts, genuine hot ends and "extras" (like a Kirigami bed), you can achieve that with self-sourcing or an LDO kit. However, that will come at quite a cost. You will end up spending around \$800 total (\$650 + \$100 rasp pi + \$50 filament) because you also need to get a Raspberry Pi and printed parts. Of course, the sky is the limit. You can spend even more and self-source with some selective upgrades and "Gucci" features, but at that point the law of diminishing returns really kicks in.

On the other hand, there are lower priced kits out there as well. Many of them frequently swap parts in and out, so the parts you get may not be consistent depending on what their sourcing strategy is. Since I haven't built any of those, I really can't say how they compare, but the rule of thumb is you tend to get what you pay for.

I hope this information will help builders make an informed decision.