

# Specifying Your Build Options

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Note: these instructions are for self-sourcing a Jubilee from scratch. A kit option (<https://www.filastruder.com/collections/jubilee/products/jubilee-motion-platform-kit>) is also available from Filastruder.

All parts for the latest stable Jubilee build are called out in the V2 Shopping List (<https://docs.google.com/spreadsheets/d/1pRzBQxVzL9c4T9b1RrKvSjlSwJJhJ7NcbSV6iJUvoXo/edit#gid=0>). If you are strictly following that list, you may safely ignore this page. If you (1) must perform part substitutes, (2) are looking for cheaper part alternatives, or (3) are looking for upgrades, read on!

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## The Shopping List

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The shopping list consists of 4 tabs for (1) primary frame components, (2) fasteners, (3) a set of two extruders, and (4) a set of optional upgrades.

### Regions and Part Alternates

While the shopping list favors a "self-sourcer" ordering parts from the United States, several alternates are listed from other international vendors. These alternates are *functionally equivalent*. That is, substituting parts for these alternates will not impact the design's behavior, safety, or instructions.

## BOM vs Shopping List

The shopping list is not quite a proper bill-of-materials (BOM). While a bill-of-materials will display all the machine's constituent parts, the shopping list breaks down all parts into their smallest "units of sale." In other words, some line items may include packs of screws when the machine may only use a few of them. This choice is done to favor the "self-sourcer" buying parts for the lowest possible price without relying on volume discounts. In all cases where this occurs, the part quantity actually used in the machine is mentioned in the comments.

## Frame Configuration

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### Pulley/Idler/Belt Options

- **Default:** Gates brand 2GT drive pulleys, idlers, and timing belt.
- **Budget:** Powge brand 2GT drive pulleys, idlers, and timing belt. (<https://www.aliexpress.com/item/1005001516376637.html>)
  - Save \$50US. These pulleys are 9mm instead to 10mm tall, which means they will require 5 extra 0.2mm shim in between belt layers.
  - After more thorough testing, these may become the default in future versions.

### 2020 Aluminum Extrusions

- **Note:** These may or may not be anodized.
- **Note:** Because the frame extrusions are used as references for alignment later, these are specified to be cut by Misumi, a vendor with the proper tooling to hold length tolerances within 0.4mm (often within 0.1mm).

### Leadscrew Options

- **Default:** T8x2 Leadscrews, 375mm long
- **Option:** T8x4 Leadscrews, 375mm long. These can effectively double the Z movement speed. (Useful for non-printing applications where the bed experiences lots of height changes.) These are currently only stocked at Filastruder (<https://www.filastruder.com/collections/jubilee/products/leadscrews>). When run with 0.9mm stepper motors, they do not accumulate error in the case where the Z axis moves in full-step increments. (For more on error accumulation with particular leadscrew/motor configurations, see the [Prusa leadscrew calculator](https://blog.prusaprinters.org/calculator_3416/) ([https://blog.prusaprinters.org/calculator\\_3416/](https://blog.prusaprinters.org/calculator_3416/))).

### L Bracket Options

- **Note:** The default L brackets are bundled with M3, 4mm flat-tip set screws. Because the frame is intended to be electrically connected together through these connectors, the shopping list specifies an extra set of cup point set screws that will cut through the anodization layer when tightened. If you are replacing the L brackets with alternates, make sure you also use them with

either \_cup\_ point or \_cone\_ point set screws. Flat set screws are not guaranteed to connect the frame together.

## Electronics Options

- **Default:** Duet2 + Duex5
- Duet3 + Raspberry Pi + 2 Duet Expander Boards
  - this is not yet officially supported with a config file, but the back panel has a hole pattern to accomodate these boards.

## Bed Options

- **Default:** Plain MIC6 Aluminum Plate (<https://713maker.com/jubilee/jubilee-heated-bed>) + 305x305 High Temperature Magnetic Sheet (<https://subtle.design/>) Note: the Magnetic Sheet doesn't seem to be available anymore.
- **Upgrade:** Aluminum Cast Tool Plate Plate with embedded magnets by [713Maker](https://713maker.com/jubilee/jubilee-magnetic-heated-bed) (<https://713maker.com/jubilee/jubilee-magnetic-heated-bed>) or [Mandala Rose Works](https://mandalaroseworks.com/products/jubilee-magbed) (<https://mandalaroseworks.com/products/jubilee-magbed>)
  - This bed plate heats up in a speedy 1-2 minutes and should be fine operating at temperatures no more than 150C.

## 305x305mm Magnetic Build Plate Options

- **Budget:** Fablam Flexplate ([https://www.seemecnc.com/products/fablam-flex-spring-steel-bed-plate-for-jubilee?\\_pos=11&\\_sid=e2a6a3d11&\\_ss=r](https://www.seemecnc.com/products/fablam-flex-spring-steel-bed-plate-for-jubilee?_pos=11&_sid=e2a6a3d11&_ss=r)) by SeeMeCNC. Note: Not available anymore
  - Save \$30US. These may become the default in a future revision.
- **Default:** BuildTak Flexplate (<https://buildtak.com/products/buildtak-flexplate-with-surface>) Note: The closest size that BuildTak now has is 304x304.
- **Optional:** Wham Bam Flexplate (<https://www.whambamsystems.com/products/305-x-305-kit-with-pre-installed-pex-build-surface>) Note: They also have a 305x305 XTR.
- **Optional:** Wham Bam XTR Flexplate (<https://www.whambamsystems.com/products/305-x-305-xtr-kit-with-pre-installed-pex-build-surface>)

## Crossbar Options

- **Default:** Aluminum Crossbar
  - a pocketed aluminum crossbar, enabling the machine to carry heavier tools and operate at higher temperatures without warping. It is also substantially easier to assemble than the carbon fiber crossbar.
  - ~160 grams
  - Top Speed: 15000 - 20000 mm/min.
  - US Vendor: [Mandala Rose Works](https://mandalaroseworks.com/products/jubilee-crossbar) (<https://mandalaroseworks.com/products/jubilee-crossbar>)
  - EU Stockist: [hightemp3d](https://hightemp3d.com/collections/jubilee-and-toolchanger-stuff/products/jubilee-crossbar) (<https://hightemp3d.com/collections/jubilee-and-toolchanger-stuff/products/jubilee-crossbar>) Note: Hightemp3d closed down shop back around March 2023.
- **Deprecated:** 6mm Carbon Fiber Crossbar
  - Light and stiff. This option was part of the original design, made by requesting a custom DXF ([https://github.com/machineagency/jubilee/tree/main/frame/fabrication\\_exports/machined\\_part](https://github.com/machineagency/jubilee/tree/main/frame/fabrication_exports/machined_part)

s/crossbar) from CNCMadness and installing four press-fit composite inserts (<https://www.mcmaster.com/93918a102>). Assembly Instructions remain on the wiki.

- ~140 grams + 20 grams with inserts
- Top Speed: 15000 - 20000 mm/min.

## XY Motor Options

- **Budget:** [Stepper Online Motors](https://www.omc-stepperonline.com/nema-17-stepper-motor/nema-17-bipolar-0-9deg-46ncm-65-1oz-in-2a-2-8v-42x42x48mm-4-wires-full-d-cut-shaft.html) (<https://www.omc-stepperonline.com/nema-17-stepper-motor/nema-17-bipolar-0-9deg-46ncm-65-1oz-in-2a-2-8v-42x42x48mm-4-wires-full-d-cut-shaft.html>)
  - Part Number: 17HM19-2004S1 [Spec Sheet](https://www.omc-stepperonline.com/download/17HM19-2004S1.pdf) (<https://www.omc-stepperonline.com/download/17HM19-2004S1.pdf>)
- **Default:** LDO 0.9 Nema 17 MAX Power Motors sold by [Filastruder](https://www.filstruder.com/products/ldo-stepper-motors-all-types?variant=31998729158727) (<https://www.filstruder.com/products/ldo-stepper-motors-all-types?variant=31998729158727>)
  - Part Number: LDO-42STH60-2004MAC(RC) [Spec Sheet](#)

## Tools

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### Extruder Options

- The [New Default Extruder](https://jubilee3d.com/index.php?title=Baby_Bullet_Extruder) ([https://jubilee3d.com/index.php?title=Baby\\_Bullet\\_Extruder](https://jubilee3d.com/index.php?title=Baby_Bullet_Extruder)) can accommodate an E3D V6 or V7. It is almost 100g lighter than the old default extruder and has extra part-cooling airflow with dual 5015 fans.
- The [Old Default Extruder](https://jubilee3d.com/index.php?title=Bondtech_Direct_Drive_Extruder) ([https://jubilee3d.com/index.php?title=Bondtech\\_Direct\\_Drive\\_Extruder](https://jubilee3d.com/index.php?title=Bondtech_Direct_Drive_Extruder)) can accommodate an E3D V6 (default) or Volcano nozzle without adjusting the heights of other components.

## Upgrades

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- [Metal Corner Plates](https://mandalaroseworks.com/products/jubilee-front-corner-brackets) (<https://mandalaroseworks.com/products/jubilee-front-corner-brackets>) - Made by Mandala Rose Works
- [Adjustable Leveling Feet](#) - leveling the printer to the surface it's printing on solves some of the worst uneven first layer issues since the frame need not be warped.

## Planned Upgrades

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- [Hemera Extruder Tool]
- [9mm Belt Upgrade]
- [E3D Tool Plate Style Bondtech Extruder] comparable to the default extruder

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