# Tantillus

## The Portable
## Open Source 3D Printer
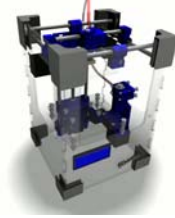
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### Assembly

**Support structure may be removed and holes may be drilled on parts supplied by Tantillus.org**

1. Remove support structure from large extruder gear and discard.

2. Remove support structures from bottom of extruder body and discard.

3. Drill 5/16" (8mm) hole through membrane of the bottom 608 bearing opening.

4. For motors with long shafts you need to drill a hole for the shaft to protrude.
5. Mark the location for drilling as pictured.
6. Drill an 8-10mm hole.

7. Install 608 bearing in bottom bearing opening.
8. Install 608 bearing in upper bearing opening.
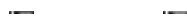
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9. Insert 5/16" nut in main gear.

10. Install 5/16" x 4 1/4" hobbed bolt from top through bearings.
    Take notice of how the hobbing lines up with the holes in the extruder, if needed install a washer under the bolt head if the space is large enough.

11. Install gear on bottom of hobbed bolt.
12. Secure gear to hobbed bolt with remaining 5/16" nut.
    Be sure it turns freely.

13. Install four #8 nuts in cavities at bottom of extruder body.
14. Secure motor mount to extruder body with four #8 x 3/4" bolts.

15. Insert 5/16" x 22mm rod into 608 bearing.
16. Press rod with 608 bearing into the idler.

17. Insert 1/4" nut into rectangular opening near top of extruder.

Bowde

18. Insert four #6 x 1-3/4" bolts through upper holes on extruder body.
19. Install idler assembly over the 4 #6 bolts.
20. Install four (or eight) springs over protruding #6 bolts.
    Some kits include 5 springs total and other include 9 total. For kits with 9 springs use the four medium springs over the four small springs in the above step. For kits with 5 springs use the four medium springs only.
21. Secure springs with four washers and four #6 nuts.
    Shown with 9 spring Kit. Only use one spring per bolt for 5 spring Kit.

## Extruder Motor

1. The extruder motor requires flat sides ground on the shaft to ensure the extruder gear does not slip.
   One of the motors included in Tantillus.org kits already has the flat sides.
2. Install two #4 nuts into small extruder gear.
3. Install two #4 x 1/4" set screws into small extruder gear.

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4. Push small extruder gear onto motor shaft.

5. Test fit motor on extruder motor mount and position the gear so it aligns with large extruder gear.

6. Once the gears are aligned, remove motor and tighten set screws on small extruder gear.

7. Install extruder motor with three M3 x 10 mm bolts with washers.

### Bowden cable

1. Take the 800mm length of PTFE tubing included in the kit and cut off a 650mm piece.

2. Using a utility knife cut two ot three notches in the end of the tube as pictured to make starting the nut easier.

3. Thread one 1/4" nut onto the tube just past where the notches end.

4. Using the utility knife cut off the protruding tubing being sure to remove the notched part entirely.
   Because the nut being threaded onto the tubing compresses the tubing it is recommended that you drill out the end of the tubing with a 1/8" drill bit if using tubing that is already close to the filament size.

5. Remove the nut and repeat steps 2 - 4 on the other end of the tube.

6. Taking one end of the Teflon tube, thread it into the 1/4" nut installed in the carriage.

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7. Insert the other end of the Teflon tube through the upper hole of the two holes located near the centre right of the rear panel.

8. Pull the Teflon tube through far enough to allow you to thread the extruder body onto the end of the tube using the nut previously installed in the top of the extruder body.

### Installation

1. Install four #8 x 1" bolts with washers through the four holes on the right panel from the outside.
2. Slide acrylic extruder spacer over the 4 bolts.

3. Install the extruder over the bolts and secure with four #8 nuts.
   <span style="color:red">Do not over-tighten, you can crack the acrylic.</span>

( **Z Axis** )

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