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BUILD YOUR OWN DDDDDDDD 3DPRINTER

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Assembly Guide

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The next five detailed and easy-to-follow stages of construction for your 3D printer.

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WARNING: Not suitable for children under the age of 14. This product is not a toy and is not designed or intended for use in play. Items may vary from those shown.





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Stage 16 Assembly Area

Stage 16: Add a slider to the right-hand Y-axis slider rod

In this stage, you add a slider to the right-hand side Y-axis slider rod after you've inserted a set screw into the slider's screwhole using the Allen key supplied with Stage 11.

When you insert the set screw into the slider, Y-axis slider rod. Also supplied with this stage screw it in far enough so that it won't fall out, are a pair of decorative acrylic cogs; keep but not so far in as to protrude into the hole that will take a head rod at a later stage. Then, put the slider onto the right-hand

these safe for later use, but do not remove their protective covering.





rod assembly that you last worked on in Stage 15. Be careful not to bend or scratch the rod

Screw the set screw into the slider



Put the 'long end' of the 2mm Allen Key into the hexagonal socket in the head of the M4 8mm set screw.





Insert the set screw into the screw hole in the slider and turn the Allen key clockwise to screw it in. Do not screw it all the way in: leave about 3mm of the set screw protruding from the slider.

HINT Because there is no head as such on a set screw, it is easy to screw it in too far. If you screw it in too far, it will impede assembly when it's time to put the head rod through the hole in the slider at a later stage.







Stop when the screw is just over half in.

Put the slider on the slider rod



Insert the slider rod you last worked on in Stage 15 into the hole in the slider, as shown, and move the slider part way along the rod.



You've inserted the set screw into the slide and put the slider on the right-hand Y-axis slider rod. Put the assembly away safely for use in the next stage.

Keep the protective coverings on the decorative cogs.

Stage 17 Assembly Area

Stage 17: Add the right-hand Y-axis slider rod to the housing

In this stage, you will add another timing pulley to the right Y-axis slider rod, then assemble the rod into the housing. You will then add the decorative cogs at the front of the housing.

Continuing to work on the right-hand Y-axis slider rod, you add the short timing pulley to it. Next you put the long timing belts over its timing pulleys and assemble it into the housing. While doing this, you

put bearings on its ends, inserting the bearings into the housing.

Finally, you attach the decorative cogs at the front of the housing. These rotate with the slider rods to show the printer in action.





Stage 17 Components

- 1: S3M timing pulley/short (15-6-7) × 1
- 2: Bearings (F686ZZ) x 2
- 3: M3 truss head screw (4mm) x 1
- 4: M3 truss head screw (12mm) x 1
- 5: M3 washers x 2

Tools you will need

Allen key (2mm) provided with Stage 11 Phillips screwdriver (size 1)

Useful Items

Thread-locking adhesive Cocktail sticks

Parts to have ready





You'll need the housing and the right-hand Y-axis slider rod you added a slider to in Stage 16. You'll also need the 3mm set screw supplied with Stage 15. Prepare the decorative cogs supplied with Stage 16 by peeling off their protective layers.





Add the small timing pulley to the slider rod



Put the Y-axis slider rod trough the hole in the S3M timing pulley/short (15-6-7) as shown so the toothed section is closer to the end of the rod and there is about 2cm between the end of the pulley and the end of the rod.



Insert the 3mm set screw into the screw hole of the pulley and loosely tighten it with the Allen key. Stop when you begin to feel resistance.

POINT

The screw holes on the timing pulleys should approximately aligned.

Screw holes aligned

Put the slider rod into the printer housing



Position the housing so the idbox logo is at the front, facing you.



Hold the slider rod as shown so that the set screw on the slider is facing you.



Insert the end of the slider rod into the hole (ringed in red) in the rear panel of the casing. Make sure the belt does not come off the pulley.



Put the front long timing belt over the short pulley at the front of the rod and then put the front end of the rod into the hole (ringed in red) in the housing's front panel.



Put the rear long timing belt over the short timing pulley at the end of the slider rod furthest from you.

Hold the belt as shown below so that the end you are putting over the pulley goes on easily.





Holding the rod in position, put one of the bearings into the hole in the housing so that the rod fits through the hole in the centre of the bearing. You might need to use a bit of force to stretch the belt.



Turn the housing round so the rear panel is facing you and put the other bearing into the hole at top left, inserting the end of the rod into the bearing.



Insert the 4mm M3 truss head screw into the screw hole on the end of the rod and tighten it fully with a screwdriver so the end surface of the rod and the head of the truss head screw are in contact and held together securely.



Make sure the bearing is fully inserted into the hole in the panel.





Put the 12mm M3 truss head screw through the hole in one of the decorative cogs.



Put one of the M3 washers on the end of the screw that protrudes through the decorative cog.



As the screws that secure the slider rods might loosen during operation of the idbox, it is recommended that thread-locking adhesive is used. Be extremely careful not to get thread-locking adhesive on any of the acrylic parts of the printer as it can damage them. Put some thread-locking adhesive on a piece of card and then use a cocktail stick to apply a small amount directly onto the thread of the screw. Thread-locking adhesive is available from online shops or from motor spares outlets. It comes in a range of strengths, use the low strength type.



With the front of the housing facing you, screw the screw (that you put through the decorative cog) into the screw hole in the end of the slider rod.



At the top left of the housing, remove the screw from the end of the slider rod, put it through the other decorative cog and washer (as in Steps 12 and 13, above) and tighten it with a screwdriver.



If you use thread-locking adhesive on the screws at the ends of the slider rods, use it on those at the rear and tighten them fully before tightening the screws at the front that also secure the decorative cogs.



The right-hand Y-axis slider rod has been installed in the housing. In the next stage, you start work on the X-axis assembly.

Stage 18 Assembly Area

Stage 18: Put a timing pulley on the X-axis slider rod

With this stage, you commence assembling the X-axis slider rods with their associated components. You have already carried out a similar process for the Y-axis slider rods, so the next few stages should pose no real problems.

The X-axis slider rod you'll be working on this time is the one that you will, in due course, install into the rear of the printer housing. The stage involves sliding a short timing pulley a little way onto one end of the rod, then inserting a set screw into the pulley's screw hole and loosely tightening it. Take care not to damage the slider rod.





Stage 18 Components

- 1: Slider rod (X-axis/rear) x 1
- 2: S3M timing pulley/short (15-6-7) × 1
- 3: M4 set screw (3mm) × 1

Tools you will need

Allen key (2mm) provided with Stage 11

Put the timing pulley on the slider rod



Insert the slider rod through the timing pulley as shown so that there is about 2cm between the toothed end of the pulley and the end of the rod.



Insert the long end of the Allen key into the hexagonal hole in the head end of the set screw, then tighten the set screw in the screw hole in the timing pulley. Tighten it until you just begin to feel resistance, so that the screw is loosely tightened only.



Stage 19 Assembly Area

Stage 19: Add a timing pulley and slider to the rear X-axis slider rod

In this stage, you add a slider and a long timing pulley to the rear X-axis slider rod you last worked on in Stage 18. It is not a complex procedure, as long as you get the order and orientation of the components correct.

Before you put either the slider or the timing pulley on the slider rod, you will insert the sets screws into their screw holes. These small screws are screwed into the holes to hold these components to the slider rod. Neither screws is tightened fully at this stage, but they are done up enough to hold the parts to the rod.





Stage 19 Components

1: Slider × 1

- 2: S3M timing pulley/long (15-6-18) × 1
- 3: M4 set screw (3mm) × 1
- 4: M4 set screw (8mm) × 1

Tools you will need

Allen key (2mm) provided with Stage 11

Parts to have ready



You will need the X-axis slider rod that you last worked on in Stage 18.

Put the slider on the slider rod



Insert the long end of the 2mm Allen key into the hexagonal hole in the head end of the 8mm set screw.



Screw the set screw clockwise into the screw hole in the slider until about 3mm of the screw is left sticking out from the screw hole.



Stop when it looks like this.



With the set screw in the slider facing away from the short timing pulley, put the slider rod through the hole in the slider as shown in the photos on the left.

Add the long timing pulley to the slider rod



Slide the long timing pulley onto the end of the slider rod as shown above, with the screw hole end of the pulley closer to the slider. Leave about 2cm between the end of the rod and the toothed end of the timing pulley.



Put the long axis end of the 2mm Allen key into the hexagonal socket in the head of the small (3mm) set screw.





HINT

You might find it easier if you begin

to screw the 3mm set screw into the long timing pulley before you insert the rod through the hole in the slider.



Insert the screw into the screw hole in the timing pulley and tighten it up clockwise. Do not tighten it fully at this stage. Stop tightening when you begin to feel some resistance.



The slider and long timing pulley have been added to the X-axis rear slider rod. In the next stage, this slider rod is installed in the housing of the printer.

Stage 20 Assembly Area

Stage 20: Add the timing belts and install the rear X-axis slider rod in the housing

In this stage, you put the three X-axis timing belts over the rear X-axis slider rod, and then fix the rod into the printer housing, supporting it with bearings at each end and holding it in place with truss head screws.

Before securing the X-axis slider rod, you adjust the position of the previously installed Y-axis long timing pulley. Then you put the three timing belts (two long, one short) over the rear X-axis slider rod and add this rod to the rear of the housing. As with the Y-axis rods, this first of the X-axis rods is mounted in bearings that are inserted into their holes in the housing from the outside. The rod is secured with truss head screws, which are fixed into the holes at each end of the rod.





Parts to have ready





Get ready the printer housing and the rear X-axis slider rod that you last worked on in Stage 19.

HINT

Adjust the position of the Y-axis long timing pulley



Loosen the set screw in the long timing pulley on the Y axis using the 2mm Allen key. This timing pulley is at the rear left of the idbox, when the printer is viewed from the front.

Do not undo the set screw so much

turn should loosen it sufficiently.

that it falls out - about one-eighth of a



Move the long timing pulley along the rod until there is a gap of about 1mm between its end and the inside of the housing, then tighten the set screw using the 2mm Allen key.



Adjust only the position of the long Y-axis timing pulley; for now, leave the three short Y-axis pulleys loosely fastened.

Install the rear X-axis slider rod in the housing



Turn the housing so that its left side is facing you.



Hold the rear X-axis slider rod so that the short timing pulley is closest to you. Put the timing belts over the pulleys, as shown above, so that a long timing belt is over the short pulley and a long timing belt and the short timing belt are over the long timing pulley. The short timing belt should be closest to the end of the rod.



Still with the short timing pulley closest to you, rest the rod on the top of the casing, as shown above.





HINT Don't worry if a timing belt comes off the toothed part of a timing pulley while you are putting the rod through the holes in the casing, as it can be put back later. Just make sure that the belts are looped over the rod.

Take the end of the rod with the long timing pulley and insert it into the hole in the casing ringed in red in the photo above, left. Insert the other end of the rod into the hole in the casing ringed in red in the photo above right.





Put one of the bearings into the hole (ringed in red above left) with its flange on the outside. Put the end of the rod through the hole in the centre of the bearing. Make sure there is no gap between the flange of the bearing and the housing.



Fit the other bearing into its hole in the housing with its flange on the outside and with the end of the rod through the hole in the bearing.

Thread-locking adhesive

As with the Y-axis slider rods (see Stage 17), it's a good idea to use thread-locking adhesive to stop screws loosening on the X-axis slider rod assembly. Apply a small amount to the thread of the screw before tightening it. Always follow the manufacturer's instructions when using thread-locking adhesive. This adhesive will damage the acrylic body of the idbox, so put some on a piece of card and use a cocktail stick to apply a small amount to the thread of the screw. The adhesive is available in a range of strengths; use the low strength type.



Insert a 4mm M3 truss head screw into the screw hole in the end of the slider rod and tighten it with a screwdriver. Hold the rod to stop it turning while you tighten the screw.



Turn the housing so that its right side is facing you.



The right end of the X-axis slider rod is the 'reference side' in relation to the housing. The head of the screw must be in close contact with the end of the slider rod, so tighten this right-hand end screw up firmly. The left end of the rod is at the 'adjustment side'. For the Y axis, the 'reference side' is at the rear and the 'adjustment side' is at the front.





Turn the housing so its left side is facing you and screw the other 4mm M3 truss head screw into the other end of the slider rod, tightening it with the screwdriver.



You've now installed the rear X-axis slider rod into the housing. In the next stage, you will work on the front X-axis slider rod assembly.



If you use thread-locking adhesive, tighten the screw on the right-hand end of the rod (the 'reference side') first before tightening the screw on the left end (the 'adjustment side').



