

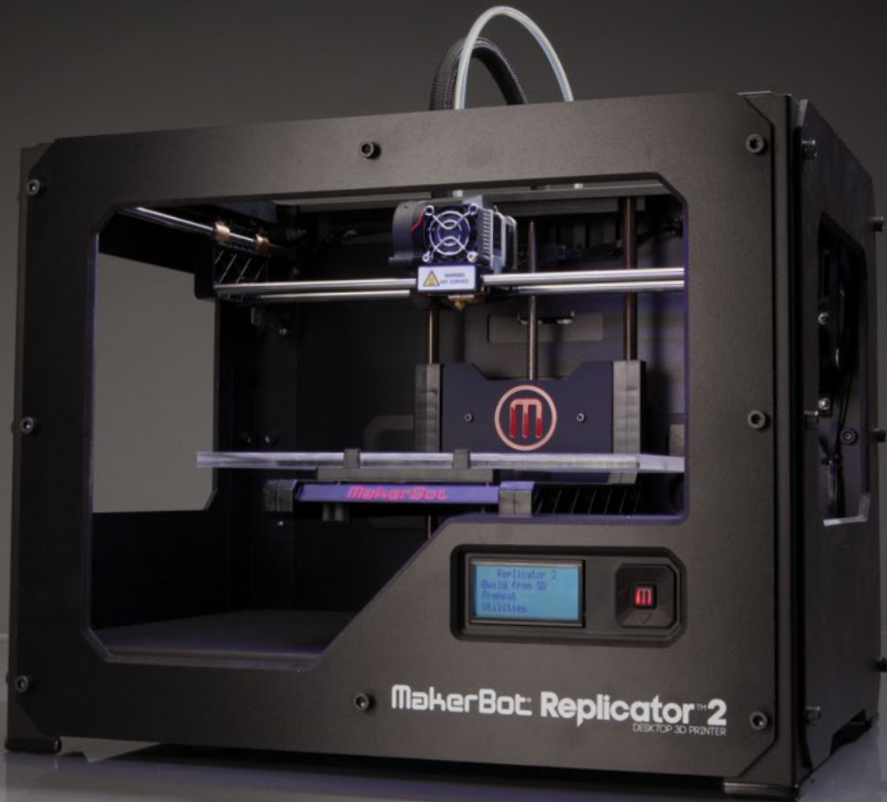


MakerBot®

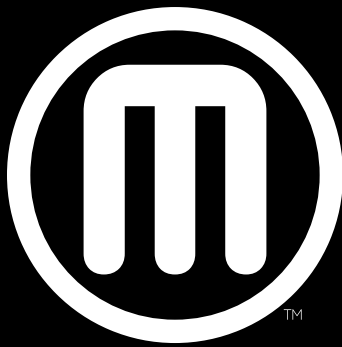
Replicator™ 2

DESKTOP 3D PRINTER

USER MANUAL | SINGLE EXTRUSION



MakerBot Replicator 2
DESKTOP 3D PRINTER



MakerBot®

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Welcome.
Let's get started.

This User Guide is designed to start your journey with the MakerBot® Replicator™2 Desktop 3D Printer off in the right direction. Even if you are familiar with earlier MakerBot machines, it is essential that you read through this guide, as there are several important and exciting updates with the MakerBot Replicator 2 Desktop 3D Printer.

In chapters A and B, you will learn the basics of the MakerBot Replicator 2 Desktop 3D Printer, how to unbox safely, and how to get set up. Chapters C–E will take you through leveling, printing, maintenance, and troubleshooting.

MakerBot is excited to welcome you to the world of the MakerBot Replicator 2 Desktop 3D Printer. Following this guide will help ensure that you are getting the most out of your machine, and that you continue to make amazing things.

WARNING: The MakerBot Replicator 2 Desktop 3D Printer generates high temperatures and includes moving parts that can cause injury. Never reach inside the MakerBot Replicator 2 while it is in operation. Always allow the MakerBot Replicator 2 to cool down before reaching inside.

CAUTION: If opening the MakerBot Replicator 2 for service, ensure that the power supply is turned off and the cord is disconnected.

SPECIFICATIONS

PRINTING

Print Technology:	Fused Filament Fabrication
Build Volume:	11.2 L x 6.0 W x 6.1 H in [28.5 x 15.3 x 15.5 cm]
Print Quality:	High 100 microns [0.0039 in] Medium 270 microns [0.0106 in] Low 340 microns [0.0133 in]
Positioning Precision:	XY: 11 microns [0.0004 in]; Z: 2.5 microns [0.0001 in]
Filament Diameter:	1.75 mm [0.069 in]
Nozzle Diameter:	0.4 mm [0.015 in]

SOFTWARE

Software Bundle:	MakerBot MakerWare™
File Types:	.stl, .obj, .thing
Supports:	Windows 7, Linux [Ubuntu 12.04+], Mac OS X [10.6/10.7/10.8]

PHYSICAL DIMENSIONS

Without Spool:	19.1 x 12.8 x 14.7 in [49 x 32 x 38 cm]
With Spool:	19.1 x 16.5 x 14.7 in [49 x 42 x 38 cm]
Shipping Box:	23 x 21.5 x 17 in [59 x 55 x 43 cm]
Weight:	25.4 lbs [11.5 kg]
Shipping Weight:	32.0 lbs [14.5 kg]

TEMPERATURE

Ambient Operating Temperature:	15° – 32° C [60° – 90° F]
Storage Temperature:	0° – 32° C [32° – 90° F]

ELECTRICAL

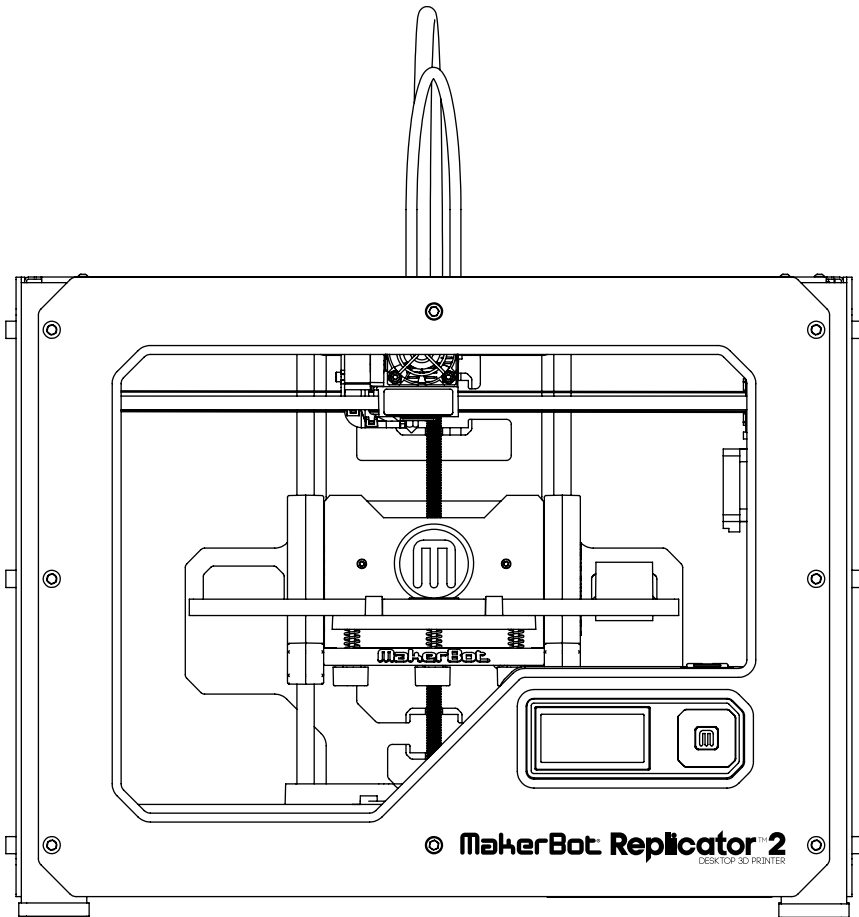
AC Input:	100 – 240 V, ~2 amps, 50 – 60 Hz
Power Requirements:	24 V DC @ 6.25 amps
Connectivity:	USB, SD card [included]

MECHANICAL

Chassis:	Powder-coated steel
Body:	PVC Panels
Build Platform:	Acrylic
XYZ Bearings:	Wear-resistant, oil-infused bronze
Stepper Motors:	1.8° step angle with 1/16 micro-stepping

HOW DOES IT WORK?

The MakerBot Replicator 2 Desktop 3D Printer makes solid, three-dimensional objects out of melted MakerBot PLA Filament. Your 3D design files are translated into instructions for the MakerBot Replicator 2 and sent to the machine via USB cable or SD Card. Then the MakerBot Replicator 2 heats the MakerBot PLA Filament and squeezes it out through an extruder to make a solid object layer by layer. This method is called Fused Filament Fabrication [FFF].



TERMINOLOGY

ACTIVE COOLING FAN: The fan that cools the MakerBot PLA Filament as it extrudes.

BUILD PLATE: The surface on which the MakerBot Replicator 2 makes an object.

BUILD PLATFORM: The support for the build plate. The build platform includes knobs for manual leveling.

PLUNGER: A part of the extruder assembly. The Delrin plunger pushes the MakerBot PLA Filament against the drive gear.

DRIVE GEAR: The gear that drives the MakerBot PLA Filament into the heater.

EXTRUDER: Draws MakerBot PLA Filament from the spool and pushes it into the nozzle, where it is heated and squeezed onto the build plate

EXTRUDER FAN: The fan that keeps the MakerBot Replicator 2 motor cool and disperses heat from the heat sink.

FAN GUARD: A grill that protects the extruder fan and protects the user from the fan.

FILAMENT GUIDE TUBE: A plastic tube that guides the MakerBot PLA Filament from the filament spool to the extruder.

GCODE: A computer language used to describe the toolpath your MakerBot Replicator 2 will use to build an object. GCode is converted to S3G before being sent to your machine.

HEAT SINK: An active heat sink that dissipates heat from the cartridge heater. It looks like an aluminum plate with fins.

LCD CONTROL PANEL: The liquid-crystal display in the front lower right corner of the MakerBot Replicator 2. This control panel provides status information about the MakerBot Replicator 2 and includes control menus and diagnostics.

MAKERBOT PLA FILAMENT: Polylactic acid filament. PLA is a renewable bioplastic. MakerBot PLA Filament is the source material from which you make objects on the MakerBot Replicator 2.

MAKERBOT REPLICATOR 2: The MakerBot Replicator 2 Desktop 3D Printer.

MAKERWARE: Free software created by MakerBot that allows you to load 3D model files, manipulate and edit those files, and send them to the MakerBot Replicator 2 for building.

MOTOR ASSEMBLY: The stepper motor and the drive block that push filament into the extruder.

TERMINOLOGY CONTINUED

MOTOR WIRES: The bundle of electrical wires that provide power to the motor.

NOZZLE: The opening on the end of the extruder from which heated MakerBot PLA Filament emerges to be spread onto the build plate.

POWER SUPPLY: An A/C power supply for the MakerBot Replicator 2 that includes a block and two plugs.

REPLICATOR G: Free, open source software that allows you to manipulate and edit .stl files and GCode files and send them to the MakerBot Replicator 2.

S3G: A compact format for describing the toolpath your MakerBot Replicator 2 will use to build an object.

SD CARD: Secure Digital memory card that can store digital data and be read by the MakerBot Replicator 2.

SPACERS: Plastic pieces that keep the extruder fan and heat sink secure and in place.

SPOOL HOLDER: A part that attaches to the back of the MakerBot Replicator 2 and holds the spool of MakerBot PLA Filament. The spool holder ensures that the MakerBot PLA Filament is fed evenly to the MakerBot Replicator 2.

.THING: A file format used by MakerWare that allows you to print multiple 3D models on the same plate.

THINGIVERSE: A website for uploading and downloading 3D model files for use with the MakerBot Replicator 2.

THREADED ROD: A long rod that is threaded along its entire length. This rod allows the build platform to move up and down.

.STL: A widely used file format for 3D models.

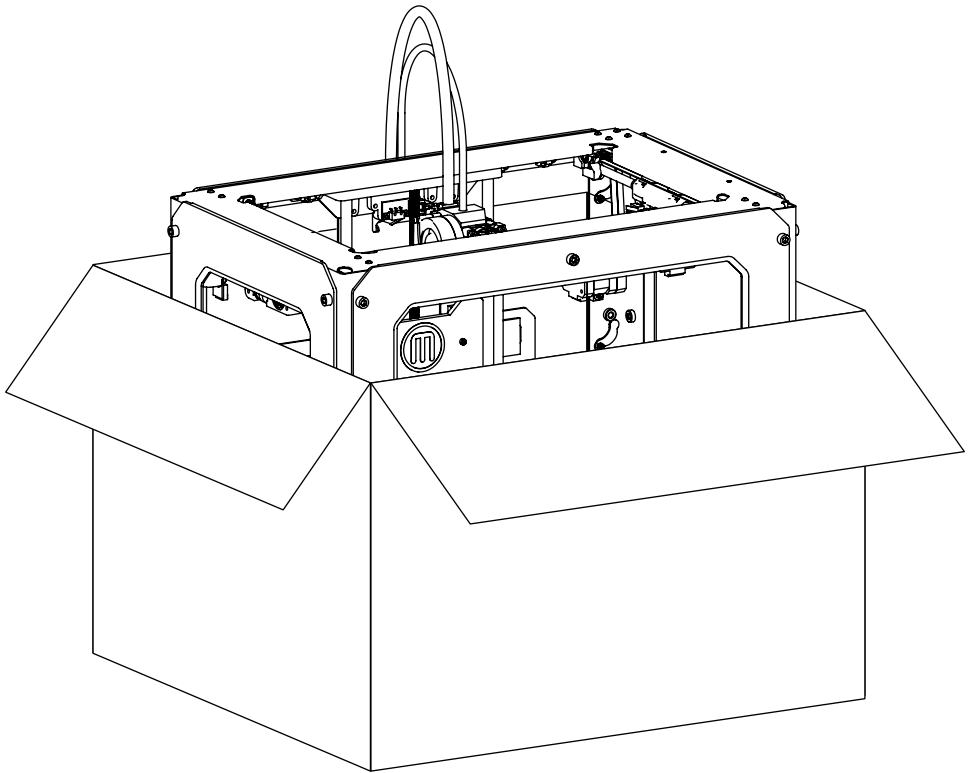
USB CABLE: A cable that allows the MakerBot Replicator 2 to communicate with a computer using the USB interface on the computer.



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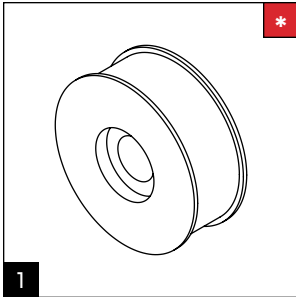
Setting Up Your MakerBot® Replicator™2 Desktop 3D Printer

When you set up your MakerBot® Replicator™2 Desktop 3D Printer, remember that it was built and packaged very carefully at the MakerBot BotCave™. We hope you'll take your time and be just as careful unpacking it and getting it set up.

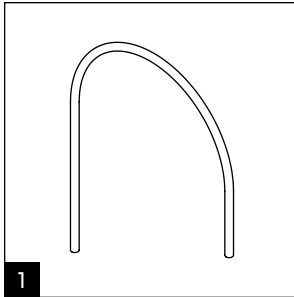


Do not force or tear anything during unpacking and setup. This may damage the MakerBot Replicator 2 Desktop 3D Printer

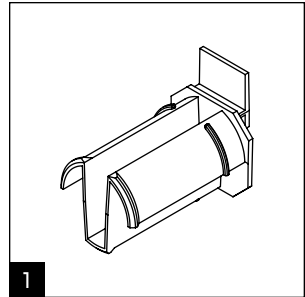
WHAT'S IN THE BOX



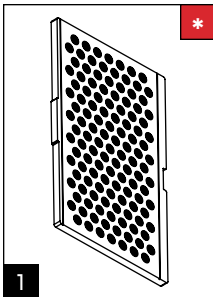
MakerBot PLA Filament
[1lb Spool]



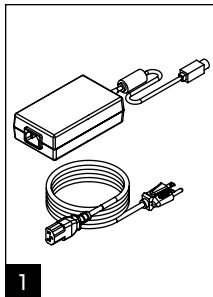
Filament guide tube



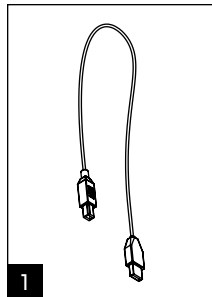
Spool holder



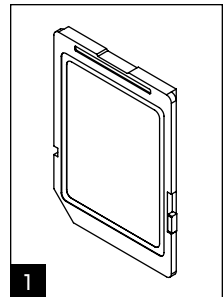
Build plate



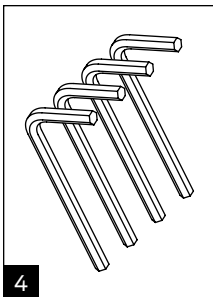
Power supply
and cable



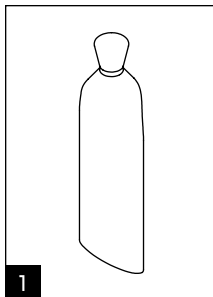
USB-A to
USB-B cable



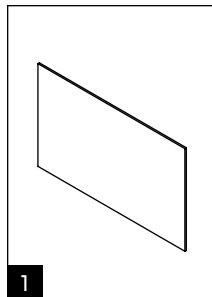
SD card



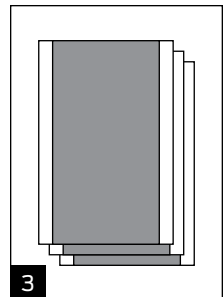
Hex wrenches



PTFE-based grease



Support card

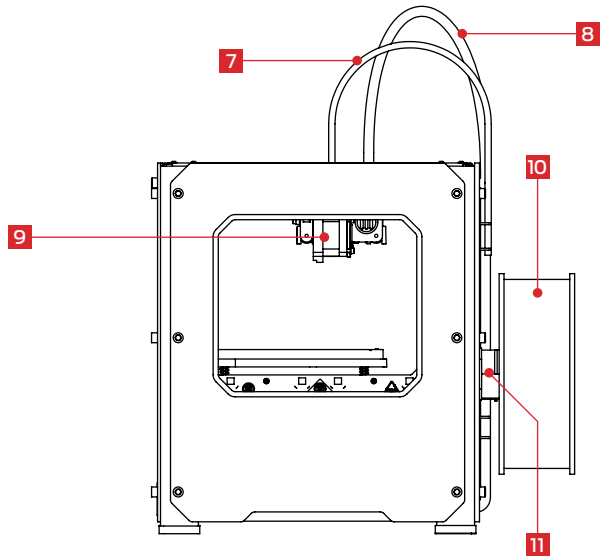
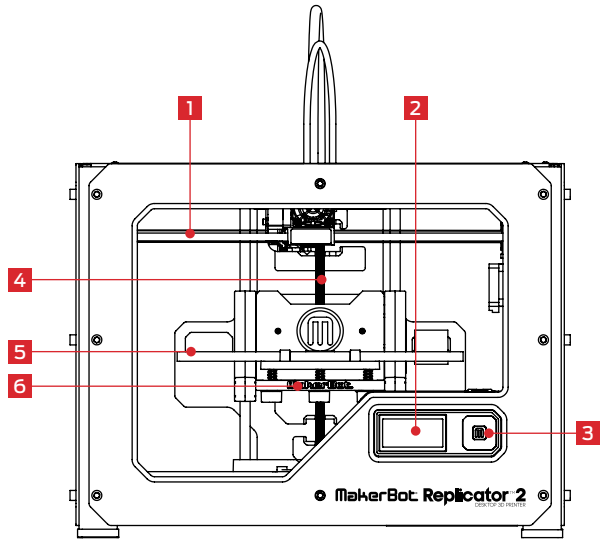


Blue tape sheets

* More options available at makerbot.com/store

MAKERBOT REPLICATOR 2 DIAGRAM

- [1] GANTRY SYSTEM
- [2] LCD PANEL
- [3] KEY PAD
- [4] THREADED Z-AXIS ROD
- [5] BUILD PLATE
- [6] BUILD PLATFORM
- [7] FILAMENT GUIDE TUBE
- [8] EXTRUDER CABLE
- [9] EXTRUDER
- [10] FILAMENT SPOOL
- [11] SPOOL HOLDER



UNPACKING YOUR MAKERBOT REPLICATOR 2

1 Opening the Box

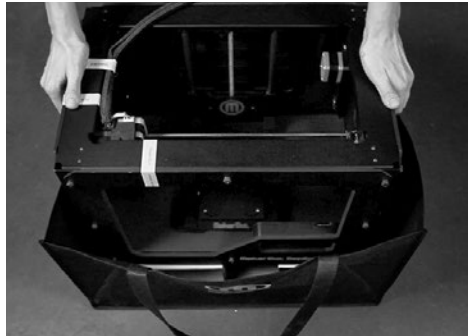
1a. Place the box on the ground. Open the box and remove the accessory sleeve at the top of the box. This sleeve contains the MakerBot PLA Filament.



2 Removing MakerBot Replicator 2 Desktop 3D Printer from the Box



2a. Grasp the two black handles. Carefully lift the reusable bag containing the MakerBot Replicator 2 and gently place the bag on the ground.



2b. Remove the cardboard inserts from the reusable bag. Grasp the MakerBot Replicator 2 by the outside of the frame, lift it out of the bag and place it on a stable work surface.

3 Removing the Accessory Sleeve from the Box

3a. Remove the second cardboard sleeve from the bottom of the bag. This sleeve contains the remaining items from the contents list.

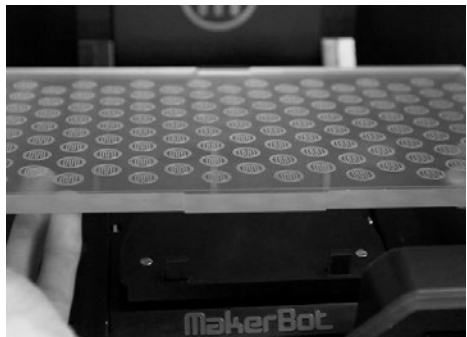


4 Raising the Build Platform

4a. Grasp the build platform by both sides and gently push it as far up as it will go.

4b. Remove the remaining cardboard inserts from the MakerBot Replicator 2.

NOTE: Your MakerBot Replicator 2 Desktop 3D Printer should now be fully unpacked. We recommend that you keep the box, cardboard sleeves, and cardboard inserts in case you need to transport your Replicator 2 in the future.



INSTALLING THE BUILD PLATE

5 Installing the Build Plate

5a. Locate the build plate. Tilt and fit the notch in the build plate onto the tab at the back of the build platform. Fit the tab in the build plate between the two pegs at the front of the build platform.

5b. To remove the build plate, push the small flexible tab on the build plate toward the back of the build platform to release the tab from the pegs. Lift the build plate from the build platform.



6 Freeing the Extruder

6a. Use scissors to cut the three bands that hold the extruder in place. Discard the bands.

NOTE: Operate scissors with care.

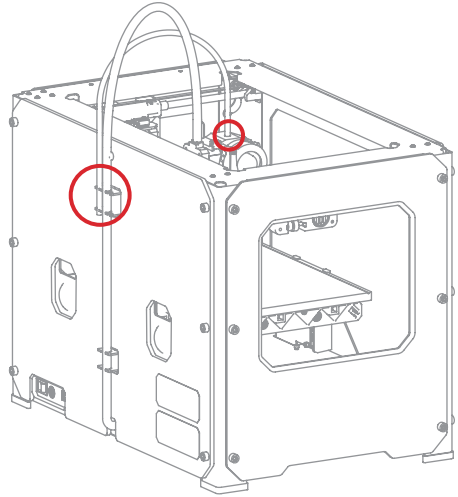


INSTALLING FILAMENT GUIDE TUBE AND SPOOL HOLDER

7 Installing the Filament Guide Tube

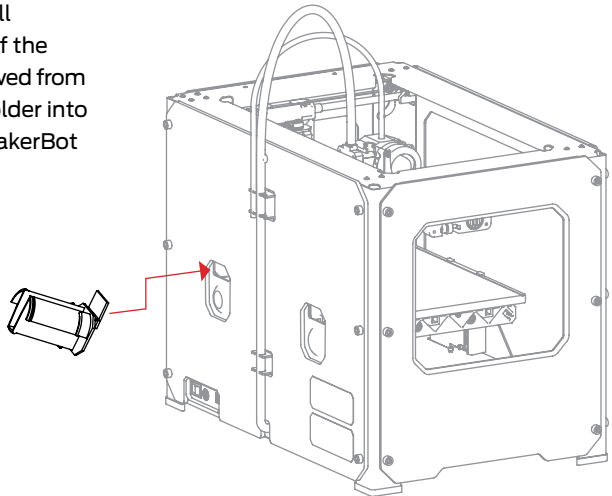
7a. Locate the filament guide tube. Insert one end into the hole at the top of the extruder and push the tube in as far as it will go.

7b. Insert the other end of the filament guide tube into the left guide tube holder [when viewed from the back] on the back of the MakerBot Replicator 2. Make sure that the end of the filament guide tube is flush with the bottom of the guide tube holder. The filament guide tube should not hang down past the bottom of the guide tube holder.



8 Installing the Spool Holder

8a. Locate the spool holder. Install the spool holder on the left side of the MakerBot Replicator 2 [when viewed from the back]. Tilt and fit the spool holder into the opening on the back of the MakerBot Replicator 2.



MOUNTING FILAMENT SPOOL AND ATTACHING USB CABLE

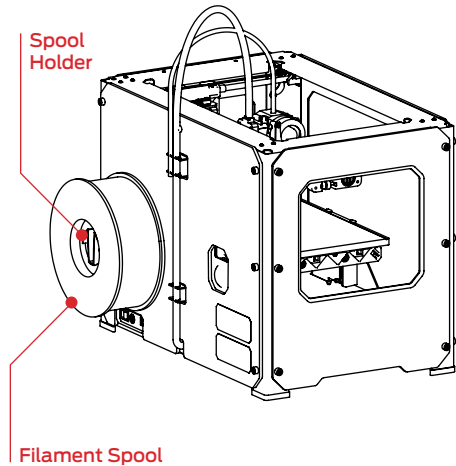
9 Mounting the Filament Spool

9a. Open the box containing the MakerBot PLA Filament. Remove the spool from its bag.

9b. Fit the spool onto the spool holder. Ensure that the MakerBot PLA Filament unwinds counterclockwise [when viewed from the back]. Squeeze the spool holder and push the spool on until it locks.

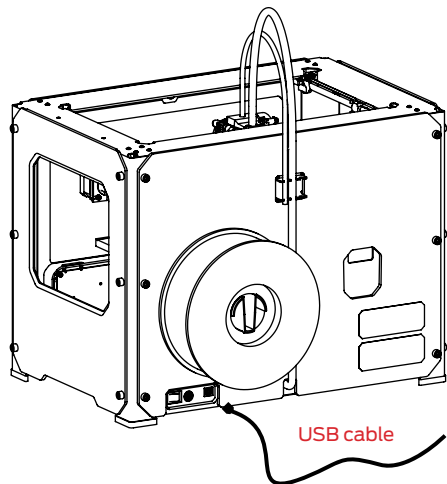
9c. Spin the spool so that the end of the MakerBot PLA Filament will unwind from the bottom of the spool.

9d. Do not plug the AC power cord into an electrical outlet until step 12 of this chapter.



10 Attaching the USB Cable

10a. Locate the USB-A to USB-B cable. Insert the USB cable into the USB-B port on the back of the MakerBot Replicator 2. Do not attach the other end of the USB cable to anything yet.



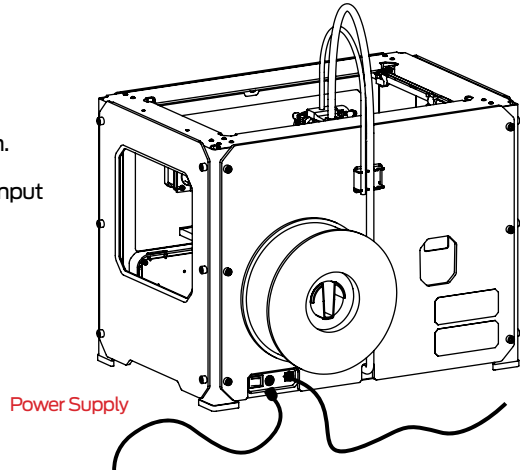
ATTACHING POWER SUPPLY AND POWERING ON

11 Attaching the Power Supply

11a. Locate the power supply and cable.
Attach the cable to the power supply.

11b. Ensure that the power switch on the
MakerBot Replicator 2 is in the OFF position.

11c. Insert the power supply into the power input
on the back of the MakerBot Replicator 2.



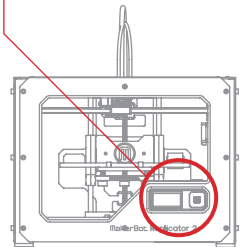
12 Power On the MakerBot Replicator 2 Desktop 3D Printer

12a. Plug the AC power cord into an
electrical outlet.

12b. Turn the power ON.

12c. The MakerBot Replicator 2 will display
welcome text on the LCD panel. This is the
beginning of the startup script that will
guide you through initial calibration and
your first build.

NOTE: The socket-outlet shall be installed near
the equipment and shall be easily accessible.






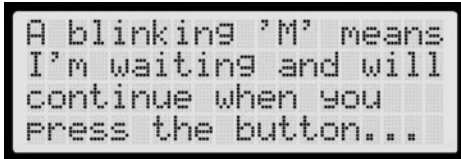
MakerBot

Startup Process:
Leveling,
Loading,
Testing

After powering on the MakerBot® Replicator™ 2, the LCD panel lights up and displays text. The LCD panel will now run the Startup Script. The Startup Script guides you through leveling the build platform, loading MakerBot PLA Filament, and creating your first build.



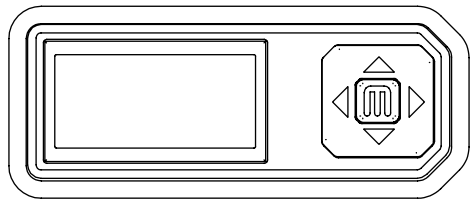
```
Welcome!  
I'm Replicator 2.  
Press the red M to  
get started!
```



```
A blinking 'M' means  
I'm waiting and will  
continue when you  
press the button...
```

THE LCD KEYPAD

- There are four arrow buttons surrounding the M button. Use the arrows to navigate through the LCD menus and make selections.
- The left arrow usually allows you to go back or cancel an action.
- A solid red M means the MakerBot Replicator 2 is working.
- A blinking red M means the MakerBot Replicator 2 is waiting for user input.



NOTE: If you don't see the Startup Script, use the up and down arrow buttons to scroll through the menu on the LCD panel. Select Utilities. Use the arrow buttons to scroll through the options under Utilities. When you see Run Startup Script, select the M button [in the center of the keypad] to select this option. You can return to the Startup Script at any time by navigating through the menus on the LCD panel. Follow the instructions in the LCD panel to set up your MakerBot Replicator 2 for the first time. If you have problems or questions, refer to the troubleshooting chapter in this manual or contact MakerBot Support.

LEVELING THE BUILD PLATFORM

After the initial welcome message, the Startup Script displays the following:

```
Our next steps will  
get me set up!  
First, we'll restore  
my build platform...
```

```
so it's nice and  
level. It's probably  
a bit off from  
shipping...
```

! Why Leveling Is Important

- If the build platform is too far from the extruder nozzle, your builds might not stick to the build plate.
- If the build platform is too close to the extruder nozzle, the build plate can block the MakerBot PLA Filament from extruding from the nozzle. This can also scratch the build plate.
- The distance between the extruder nozzle and the build plate should be about the thickness of the MakerBot Support card included with your MakerBot Replicator 2, in the accessory sleeve.

⚙️ How to Level the Build Platform

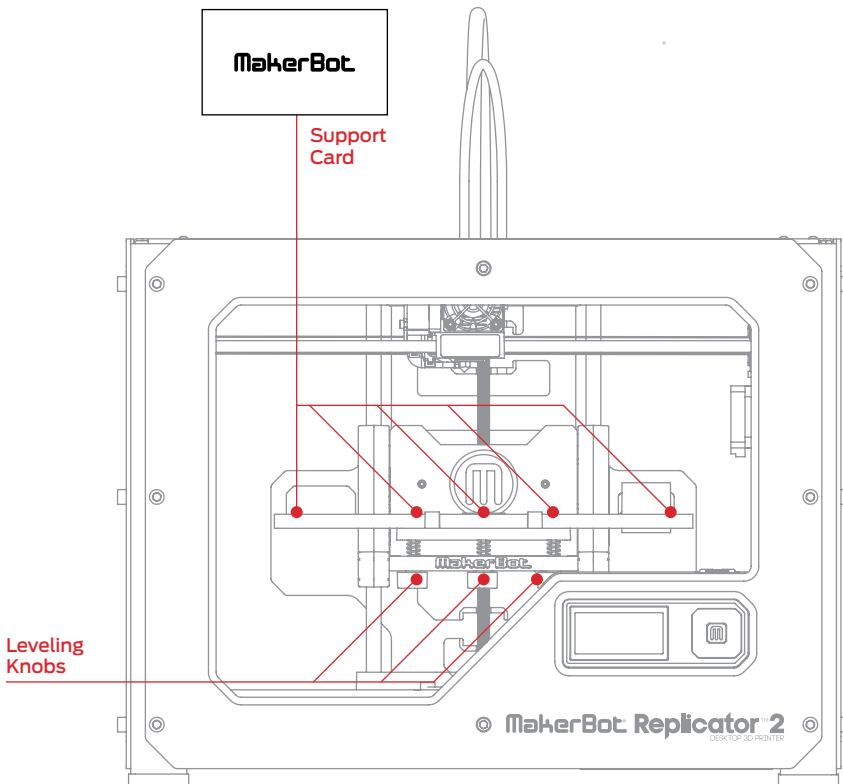
To level the build platform, you must adjust the three knobs under the build platform. These three knobs lower and raise the build platform.

- Tightening the knobs [turning them to the right] moves the build platform away from the extruder nozzle.
- Loosening the knobs [turning them to the left] moves the build platform closer to the extruder nozzle.



What You Will Do

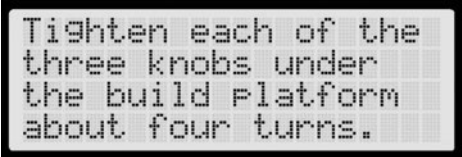
- During the leveling instructions, the MakerBot Replicator 2 will move the extruder nozzle to various positions on the build plate.
- At each position, the Startup Script will prompt you to adjust the knobs until you can pass the MakerBot Support card between the plate and the extruder nozzle. You should feel some friction on the MakerBot support card but still be able to easily pass the card between the plate and the extruder nozzle without tearing or damaging the card.



LEVELING THE BUILD PLATFORM CONTINUED

1 Make Some Room Between the Build Plate and the Nozzle

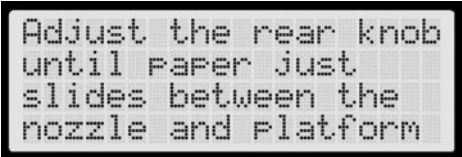
When directed by the LCD screen, tighten each of the three knobs under the build platform about four turns.



Tighten each of the
three knobs under
the build Platform
about four turns.

2 Adjust the Rear Knob

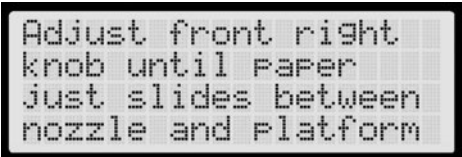
When directed, adjust the rear knob until the Support card just slides between the nozzle and build plate.



Adjust the rear knob
until Paper just
slides between the
nozzle and Platform

3 Adjust the Right Knob

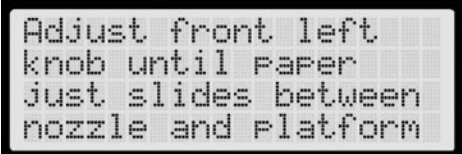
When directed, adjust the front right knob until the Support card just slides between nozzle and build plate.



Adjust front right
knob until Paper
just slides between
nozzle and Platform

4 Adjust the Left Knob

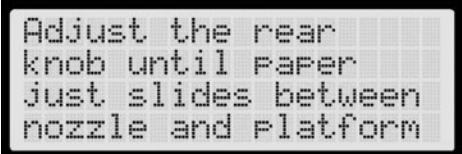
When directed, adjust the front left knob until the Support card just slides between nozzle and build plate.



```
Adjust front left  
knob until Paper  
just slides between  
nozzle and Platform
```

5 Adjust the Rear Knob Again

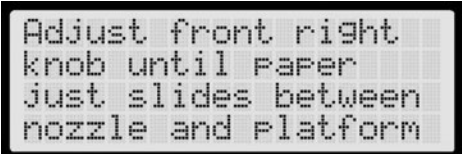
When directed, adjust the rear knob until the Support card just slides between nozzle and build plate.



```
Adjust the rear  
knob until Paper  
just slides between  
nozzle and Platform
```

6 Adjust the Right Knob Again

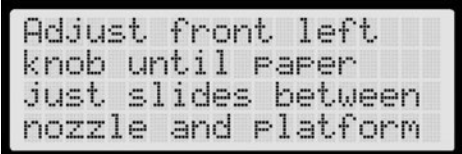
When directed, adjust the front right knob until the Support card just slides between nozzle and build plate.



```
Adjust front right  
knob until Paper  
just slides between  
nozzle and Platform
```

7 Adjust the Left Knob Again

When directed, adjust the front left knob until the Support card just slides between nozzle and build plate.

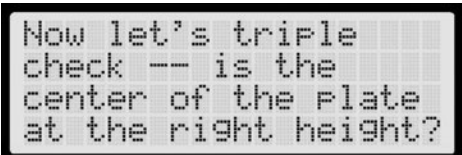


Adjust front left
knob until paper
just slides between
nozzle and platform

8 Confirm Your Adjustment

When directed, check that the Support card just slides between the nozzle and build plate when the nozzle is at the center of the plate.

NOTE: If at any time you have problems or if you need to level your build platform again, you can use the arrow buttons to navigate through the LCD menus until you find the Utilities menu. Press the M button to select this menu. Use the arrow buttons to navigate through the menu options until you find Level Build Plate. Press the M button to select this menu option.



Now let's triple
check -- is the
center of the plate
at the right height?

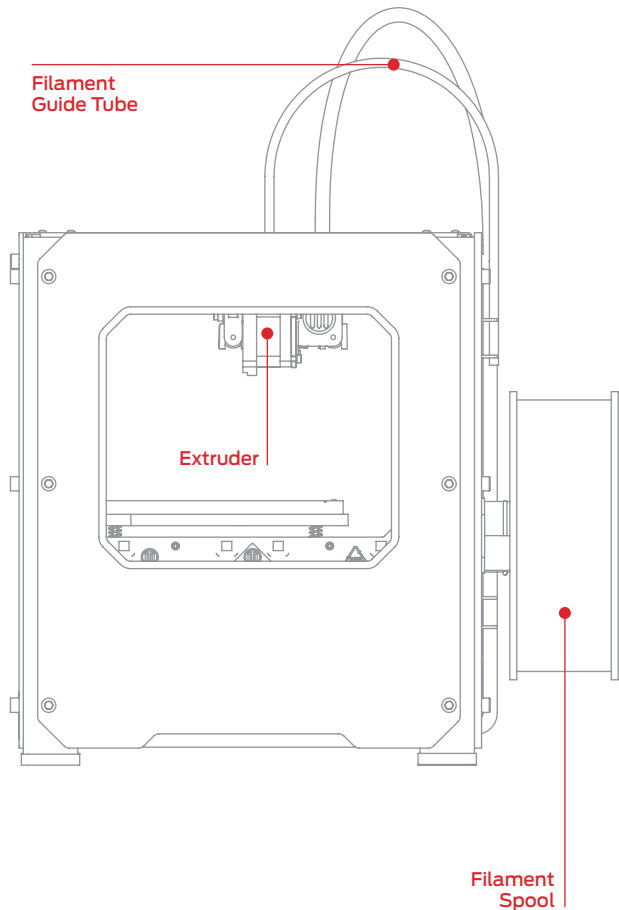
LOADING MAKERBOT PLA FILAMENT



What You Will Do

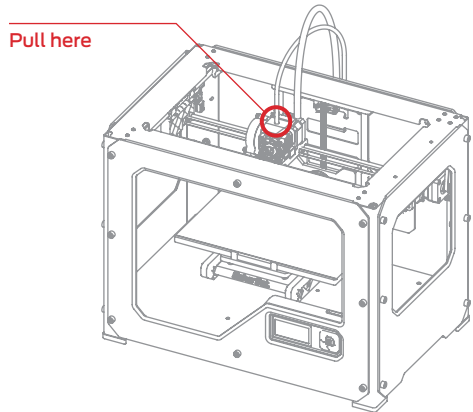
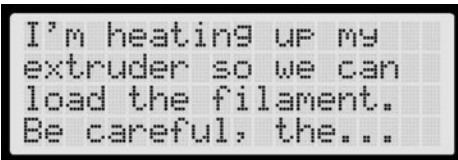
When you have completed the initial leveling tasks, the LCD menu displays the following text: “Aaah, that feels much better. Let’s go on and load some plastic!” Before building, you must load the MakerBot PLA Filament into the extruder. The extruder heats the MakerBot PLA Filament and uses the melted material to build your objects.

- Remove the end of the filament guide tube from the hole in the top of the extruder.
- Feed the free end of the MakerBot PLA Filament from the spool into the end of the filament guide tube that is on the back of the MakerBot Replicator 2.
- Push the MakerBot PLA Filament all the way through the filament guide tube.
- Insert the free end of the MakerBot PLA Filament into the hole in the top of the extruder. This requires gentle force.
- Wait for the MakerBot PLA Filament to heat and extrude.
- Return the filament guide tube to the hole in the top of the extruder.



1 Detach the Filament Guide Tube

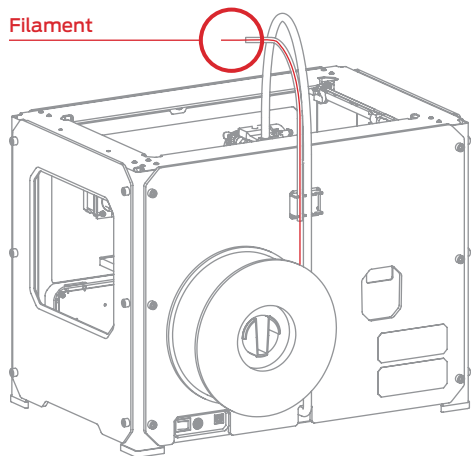
Locate where the filament guide tube attaches to the top of the extruder. You must remove the filament guide tube from the extruder. To remove the tube, gently pull it out of the hole in the top of the extruder.



2 Feed the Filament Through the Filament Guide Tube

Free the end of the MakerBot PLA Filament from the filament spool. With a pair of scissors, cut a clean edge. Feed the end of the MakerBot PLA Filament into the end of the guide tube connected to the back of the MakerBot Replicator 2. Feed the MakerBot PLA Filament through the guide tube until it emerges from the other end of the tube.

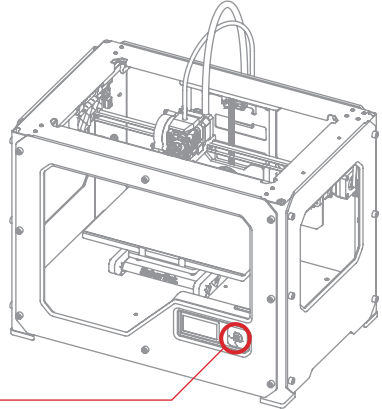
NOTE: To avoid filament jams, ensure that the MakerBot PLA Filament feeds from the bottom of the spool toward the top of the spool. Ensure that the MakerBot PLA Filament is mounted on the left spool holder when viewed from the back and that it unspools clockwise.



3 Press the M to Begin Heating the Extruder

After you've fed the MakerBot PLA Filament all the way through the guide tube, press the M button on the LCD menu. The MakerBot Replicator 2 will start to heat your extruder.

WARNING: Do not touch the bottom of the extruder while it's heating — it heats to 230° C.



Press the M

4 Press the M to Continue

After the extruder reaches 230° C, the LCD panel will prompt you to load the MakerBot PLA Filament into the extruder. Click through the message until your MakerBot Replicator 2 asks you to press the M when you see plastic extruding.

The LCD menu will display the following: "OK. I'm ready. First we'll load the extruder. Push filament in the extruder block until you feel the motor tugging the plastic in. When filament is extruding out of the nozzle, press 'M' to stop extruding."

```
I'm heating up my  
extruder!  
Please wait!  
█
```

```
OK I'm ready!  
Pop the guide tube  
off and push the  
filament through...
```

```
the extruder block  
until you feel the  
motor tugging the  
Plastic in...
```

```
When filament is  
extruding out of the  
nozzle, Press 'M'  
to stop extruding.
```

5 Push the Filament into the Extruder

Take the end of the MakerBot PLA Filament closest to the extruder and firmly push it into the hole in the top of the extruder. Ensure that the Filament goes into the center of the opening and doesn't get caught at the edge of the opening.

Maintain pressure on the Filament and continue pushing it into the opening.

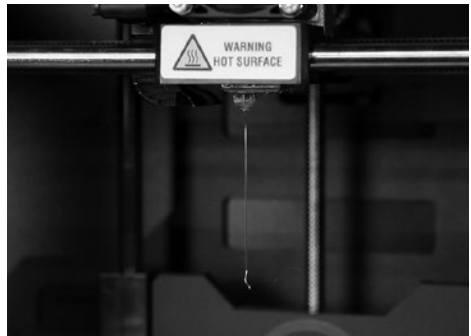
After about five seconds, you should begin to feel the motor pulling in the Filament. Maintain pressure for another five seconds and then let go.



6 Stop Extrusion

Watch the nozzle of the extruder. After a few moments, you should see a thin string of the MakerBot PLA Filament that you loaded come out of the nozzle. Press the M button to stop extrusion.

NOTE: Don't be surprised if the filament that initially comes out of the nozzle is not the color you expected. There's probably some filament inside the extruder left over from our testing process at the MakerBot BotCave. Wait until you see the color that you loaded come out of the nozzle before you press the M button.



7 Return the Filament Guide Tube

Push the guide tube back into the opening on the top of the extruder.



8 Remove the Extruded PLA

Wait a few minutes for the extruded PLA to cool, then pull it off the nozzle. Don't touch the nozzle; it may still be hot. You can discard this extra filament. Don't leave plastic clinging to the extruder nozzle. This can cause newly extruded plastic to stick to the nozzle instead of the build platform.

NOTE: If you have problems or need to load the MakerBot PLA Filament again, you can use the arrow buttons to navigate through the LCD menus until you find the Utilities menu. Press the M button to select this menu. Use the arrow buttons to navigate through the menu options until you find Filament Options and select the menu. Use the arrow buttons to navigate to Load Filament and select the option.



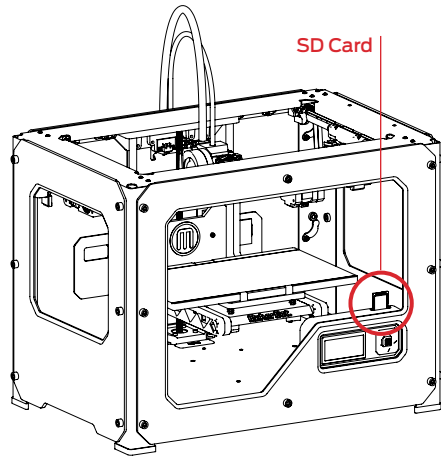
MAKING A TEST OBJECT FROM THE SD CARD

1 Inserting the SD Card

The Replicator 2 package includes an SD card that is already loaded with files for making test objects.

1a. Locate the card among the contents in the accessory sleeve.

1b. Insert the card into the SD port directly behind the LCD panel.



2 Selecting a Project from the SD Card

After you have successfully leveled the build platform and loaded the MakerBot PLA Filament into the extruder, the LCD panel will ask you: “How’d it go? Ready to make something?” Select “Yes” and the LCD panel will display: “Awesome! We’ll go to the SD card menu and you can select a model!”

2a. Use the arrow keys to navigate through the list of models on the SD card.

2b. To select a model, press M.

2c. The MakerBot Replicator 2 Desktop 3D Printer will begin to make your object. You can use the LCD panel to monitor the temperature of the extruder and the status and progress of your object.

MAKING A TEST OBJECT FROM THE SD CARD CONTINUED

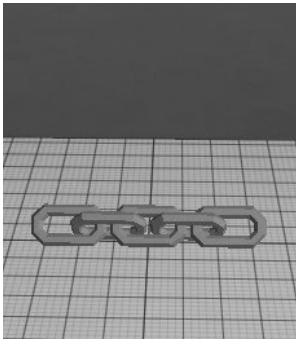


Projects Available on the SD Card

CHAIN LINKS

File Name: Chain Links
Make Time: 15 Minutes

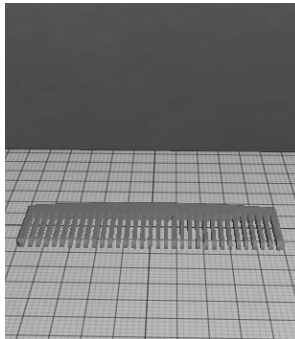
Design By: Sal
Thingiverse:28405



COMB

File Name: Comb
Make Time: 30 Minutes

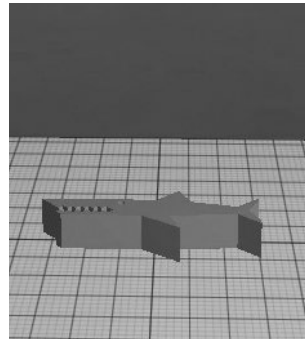
Design By: repraprock
Thingiverse:1140



MR JAWS

File Name: Mr Jaws
Make Time: 25 minutes

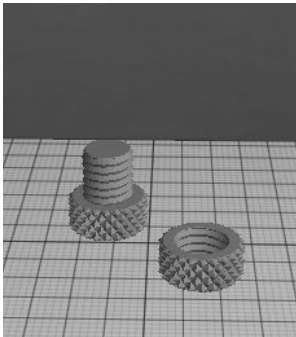
Design By: Mahoney
Thingiverse:14702



NUT AND BOLT SET

File Name: Nut and Bolt
Make Time: 55 minutes

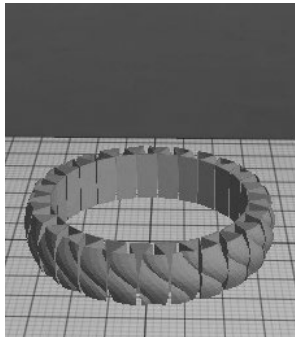
Design By: aubenc
Thingiverse:9095



STRETCHY BRACELET

File Name: Stretchlet
Make Time: 40 minutes

Design By: Emmett
Thingiverse:13505



NAME:

File Name: _____

Make Time: _____

Design By: _____

Thingiverse: _____

Space for
your designs!



MakerBot

Making an Object with MakerBot MakerWare

How to make an object using a computer and MakerBot® MakerWare™.



USING MAKERBOT MAKERWARE

i

MakerBot MakerWare is software that prepares digital 3D designs to be made by the MakerBot Replicator 2 Desktop 3D Printer.

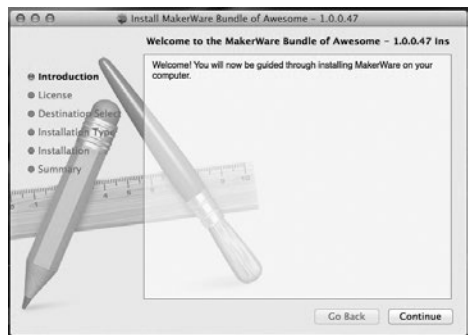
1 Download and Install MakerBot MakerWare

1a. Go to the computer that you plan to connect to your MakerBot Replicator 2 with the supplied USB cable.

1b. Open a Web browser, go to www.makerbot.com/makerware and download the MakerBot MakerWare installer to your local computer.

1c. Execute the installer and follow the directions to install the software.

1d. Use the supplied USB cable to connect your MakerBot Replicator 2 to the computer where you installed MakerBot MakerWare.



2 Download an Object From Thingiverse

Thingiverse is a website where MakerBot users and others can share design files.

2a. Go to the computer that is connected to your Replicator 2.

2b. Open a Web browser and go to www.thingiverse.com.

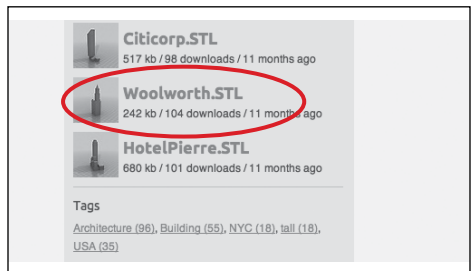
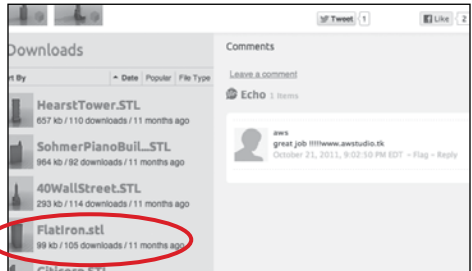
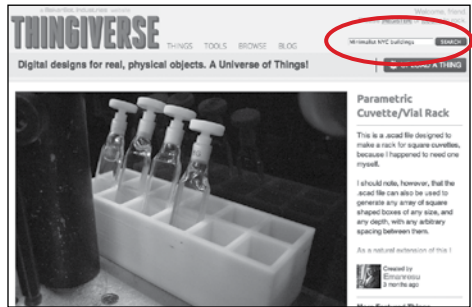
2c. In the Search field in the upper right, enter “Minimalist NYC buildings.” Select the [Search] button.

2d. Your search results should include “Minimalist NYC buildings by JonMonaghan.” Click on the link.

2e. On the page for “Minimalist NYC buildings,” go to the Downloads section in a bar on the left side of the page.

2f. Click on the link for FlatIron.stl and save the file to your local computer.

2g. Click on the link for Woolworth.stl and save the file to your local computer.



3 Open MakerBot MakerWare

[1] CAMERA HOME: Resets MakerWare to the default view of the object.

[2] +/-: Zoom in and out. You can also use the scroll wheel on your mouse to zoom in and out.

[3] LOOK: With this function selected, you can click and drag to rotate the plate and the object. You can also select the Change View submenu and view the Top, Side, or Front of the object.

[4] MOVE: With this function selected, you can click and drag to move the object around the build plate. You can also select the Change Position submenu to move the object by specific amounts.

[5] TURN: With this function selected, you can click and drag to rotate the object. You can also select the Change Rotation submenu to rotate the object by a specific number of degrees. Right-click and drag with this function selected to rotate your view.

[6] SCALE: With this function selected, you can click and drag to enlarge or shrink the object. You can also select the Change Dimensions submenu and manually change the dimensions of the object.

[7] ADD: Clicking on this button allows you to add an object to this plate. The combined objects can be stored in a .thing file.

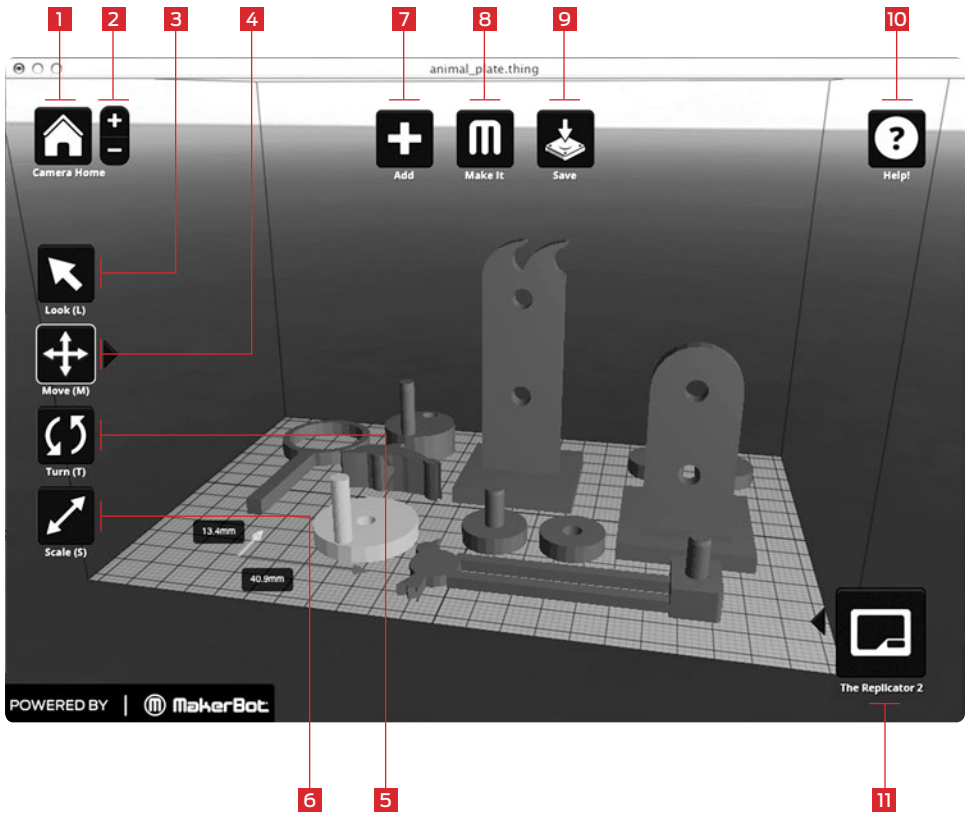
[8] MAKE IT: Leads to the Make dialog, where you can specify printing resolution and other printing options.

[9] SAVE: Allows you to save the current plate as a file for later use.

[10] HELP: Opens a guide to MakerWare's basic functions.

[11] STATUS ICON: Displays the status of your connection to your Replicator 2. Click to open a submenu displaying build progress.

3 Open MakerBot MakerWare | Continued



MECHANICAL ANIMALS

Design By: sconine

Thingiverse: 11980

4 Open .stl files in MakerBot MakerWare

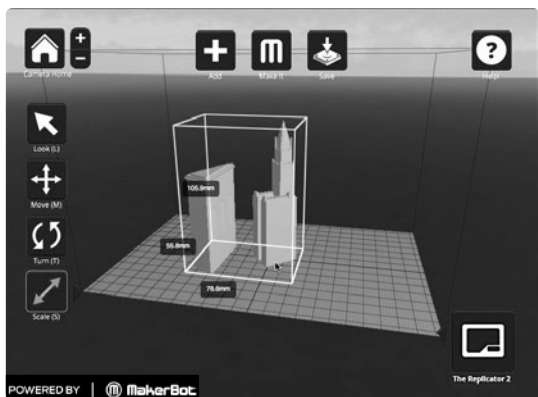
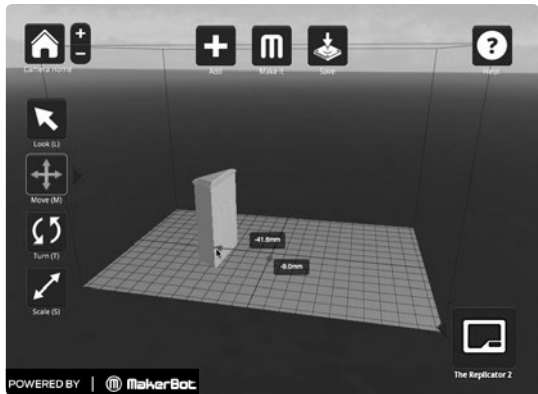
4a. Click on the Add button. Navigate to the location of the file FlatIron.stl and select it.

4b. Select the Move button and click and drag the FlatIron Building to the left of center.

4c. Click on the Add button. Navigate to the location of the file Woolworth.stl. Select this file. Now you should see both the FlatIron Building and the Woolworth Building models in your virtual build space.

4d. Now you can decrease the size of both models simultaneously. Click on the FlatIron Building to select it. Hold down the shift key and click on the Woolworth Building. Now release the shift key. Both files should be selected.

4e. Select the Scale button. Click and drag to change the size of both models.



Minimalist NYC buildings
Design By: JonMonaghan
Thingiverse: 12762

5 Save and Make Your file

5a. Select the Save button. Specify a name and location for the file. For example, you could name the file flatiron_woolworth.thing. Select the Make It button. The Make dialog appears:

[1] MAKE WITH: Select MakerBot Replicator 2, if not already selected.

[2] QUALITY: Specify the quality of your object. Higher quality means lower layer height numbers.

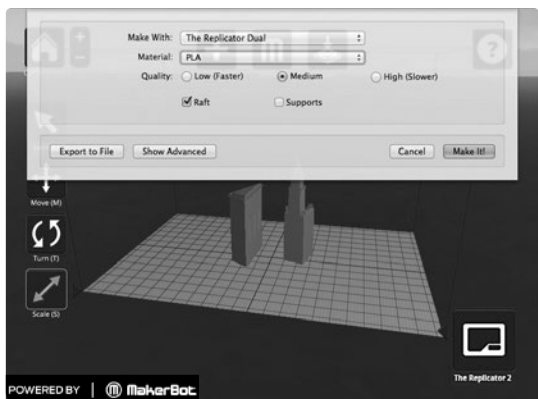
[3] RAFT: Select this checkbox if you want your object to sit on a raft. Rafts provide a base for supports and help your object stick to the build plate if the build plate is not exactly level. You can easily remove rafts after making the object.

[4] SUPPORTS: Select this checkbox if you want your object to include removable support structures for overhanging elements.

[5] EXPORT TO FILE: MakerWare sends your model to the Replicator 2 as a set of instructions in the S3G format. Export to file allows you to save the S3G file or GCode file [an intermediate format] to your computer or an SD card.

[6] CANCEL: Cancel this process.

[7] MAKE IT!: Send the file to the Replicator 2 for making.



USING MAKERBOT MAKERWARE CONTINUED

5 Save and Make Your File | Continued

5b. Accept the default values and select the Make It! button.

5c. The Replicator 2 will start to make your buildings.



USING REPLICATOR G

You can also use the open source ReplicatorG software to view, manipulate, and edit files from www.thingiverse.com and to send files to your Replicator 2.

To download the ReplicatorG software, go to replicat.org/download.

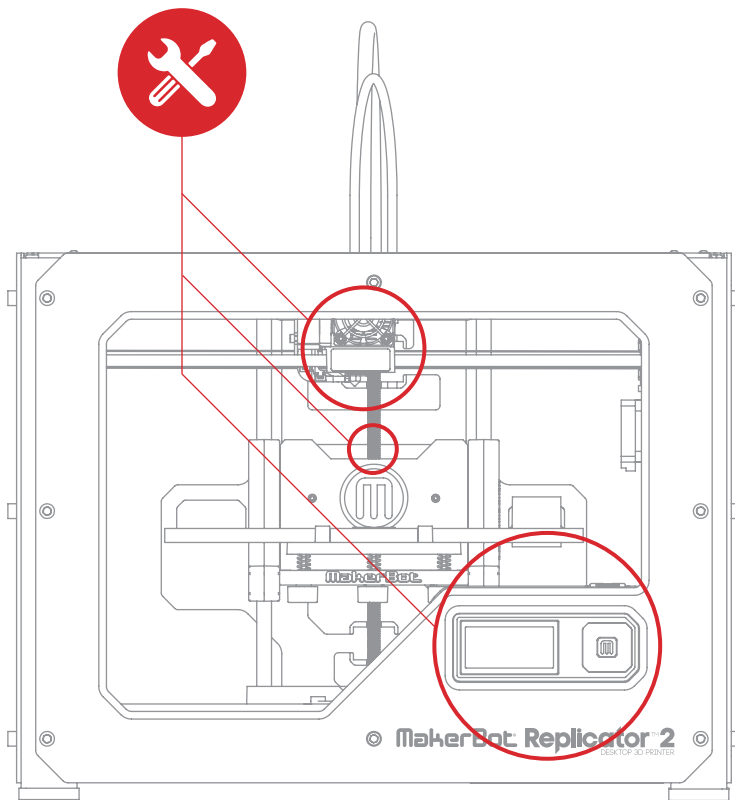
To configure the ReplicatorG software to work with your Replicator 2, go to www.makerbot.com/docs/replicator/software/.



MakerBot

Troubleshooting, Diagnostics, and Maintenance

This chapter describes basic troubleshooting and maintenance tasks. For details on more advanced troubleshooting and maintenance tasks, go to makerbot.com/docs



TROUBLESHOOTING Common Problems and How To Fix Them

PROBLEM

SOLUTION

Can't load MakerBot PLA Filament into the extruder

Make a fresh cut at the end of the MakerBot PLA Filament. Cut the MakerBot PLA Filament at an angle — a narrow tip will help with loading.

Use more force when pushing the MakerBot PLA Filament into the extruder. Grasp the Filament firmly and push it into the middle of the hole on top of the extruder. To increase your grip, you can hold the Filament with a pair of pliers.

Ensure that you insert the MakerBot PLA Filament straight down into the extruder, not diagonally.

After you feel the motor grab the Filament, continue to maintain pressure on the Filament for another five seconds.

Extruder makes a clicking noise when loading MakerBot PLA Filament

Try cleaning the drive gear as explained in the Maintenance section of this chapter. If that doesn't help, adjust the plunger, also as explained in this chapter.

Object is stuck to build plate

Use a craft spatula to gently pry the object from the build plate.

In the future, you can cover your build plate with painter's tape. This allows your objects to stick to the build plate but be removed more easily.

TROUBLESHOOTING Common Problems and How To Fix Them | CONTINUED

PROBLEM	SOLUTION
First layer of objects is very thin, and then extruder stops	<p>Your build plate may be so close to the extruder that it is preventing plastic from coming out of the nozzle.</p> <p>Tighten each knob on the bottom of the build plate by a quarter turn to move the platform farther from the extruder nozzle.</p> <p>If you continue to have problems, you can run the leveling script from the LCD menu at Utilities > Level Build Plate.</p>
Can't remove MakerBot PLA Filament from extruder when unloading	<p>Run the filament load script in the onboard Utilities menu and let the filament advance for about five seconds.</p> <p>Then run the unload script again.</p>

DIAGNOSTICS LCD PANEL | TOP-LEVEL MENU



LCD: The Top-Level Menus

BUILD FROM SD	Displays the list of models on the SD card. Select one to start a build
PREHEAT	Allows you to preheat the extruder.
UTILITIES	Tools that allow you to configure and maintain your MakerBot Replicator 2.
INFO AND SETTINGS	Optional settings and information about the MakerBot Replicator 2.

UTILITIES

Monitor Mode

Displays the current temperature of the extruder. When making an object, displays the percent completion.

Change Filament

Scripts that walk you through tasks associated with the MakerBot PLA Filament.

LOAD: Script that walks you through the process of loading the MakerBot PLA Filament.

UNLOAD: Script that walks you through the process of unloading the MakerBot PLA Filament.

Level Build Plate

Script that walks you through the process of leveling the build plate.

Home Axes

Sets the build plate and the extruder to the default “home” positions.

Jog Mode

Allows you to control the movements of the extruder and platform via the LCD panel.

Run Startup Script

Script that walks you through the initial tasks to configure the Replicator 2 for your first object.

Enable Steppers

Engages the stepper motors. You cannot manually move the build platform or the extruder when the stepper motors are engaged. This option appears only when the stepper motors are disengaged.

Disable Steppers

Disengages the stepper motors. You can manually move the build platform or the extruder only when the stepper motors are disengaged. This option appears only when the stepper motors are engaged.

Blink LEDs

Blinks the LED lights on the Replicator 2 at about 4 blinks per second.

INFO AND SETTINGS

Bot Statistics

Displays the estimated total hours and minutes of building in the lifetime of the Replicator 2 and the duration [in hours and minutes] of the last build.

General Settings

Optional settings and information.

SOUND: Turns the Replicator 2's indicator sounds on and off.

LED COLOR: Lets you turn off the LED lights or select a color. Choices are Blue, Green, Pink, Orange, Purple, White, and Off.

ACCELERATE: Turn acceleration on or off. Note that with Acceleration off you should not use build speeds faster than 45mm/s.

HELP TEXT. Specifies whether you want lengthy help text [On] or abbreviated help text [Off].

HEAT LEDs. Specifies whether or not you want the LED light to change color when the Replicator 2 is heating.

TOOL COUNT: Specifies whether the Replicator 2 has one extruder or two. Your Replicator 2 has a single extruder.

HEATED PLATE: Specifies whether the Replicator 2 has a heated build plate. Your Replicator 2 does not have a heated build plate.

Preheat Settings

Lets you change the temperature setting for the extruder. Use the up and down arrows to select an extruder. Press M to select, use the up and down arrows to change the temperature, and press the M button again to save your setting.

Version Number

Displays the version number of the firmware.

Restore Defaults

Returns all the settings on the Replicator 2 to factory settings. When you select this option, a new menu appears where you can use the arrow buttons to choose "Yes" or "No".

MAINTENANCE



Unloading MakerBot PLA filament

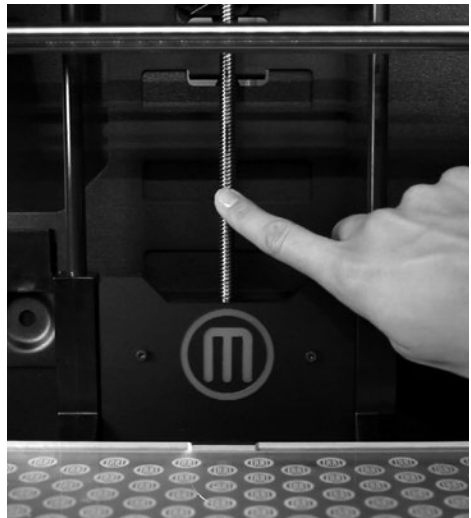
If you need to unload the MakerBot PLA Filament [for example, to load a different color of MakerBot PLA Filament or to perform maintenance on the extruder], the LCD menu can walk you through the process. To view the script for unloading the MakerBot PLA Filament, go to the LCD panel and select Utilities > Filament Options > Unload.



Lubricating the Threaded Rod and the X-Axis Idler Pulley

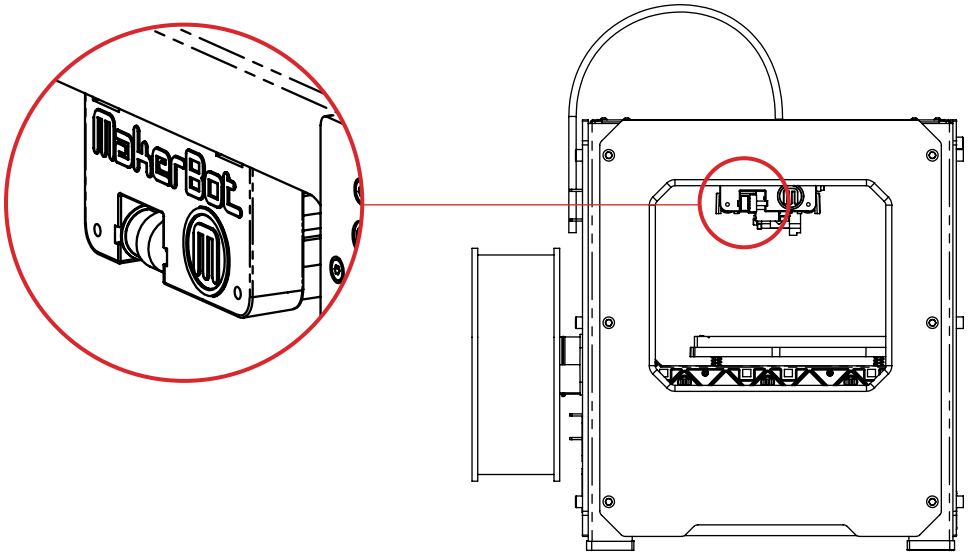
After about 50 hours of build time, you should lubricate the threaded rod on your Z-axis and the X-axis idler pulley. To lubricate the threaded rod and the idler pulley:

1. Find the tube of PTFE-based grease included with your Replicator 2.
2. Grab both sides of the build platform and push it gently to the bottom of the MakerBot Replicator 2.
3. Use a clean, lint-free rag [or your finger] to spread the PTFE-based grease onto the top section of the threaded rod.
4. Make sure you get the grease inside of the threads themselves.
5. Grab both sides of the build platform and move it to the top of the MakerBot Replicator 2.
6. Use a clean, lint-free rag [or your finger] to spread the PTFE-based grease onto the bottom section of the threaded rod. Make sure you get the grease inside of the threads themselves.





Lubricating the Threaded Rod and the X-Axis Idler Pulley | Continued



7. Locate the X-axis idler pulley. If you are facing the front of the Replicator 2, the idler pulley is at the top left side. The idler pulley is one of the pulleys that allow the rubber belt to move the extruder from left to right. The pulley at the other end of the belt is called the timing pulley and does not require lubrication.

8. Squeeze a small amount of the PTFE-based grease directly onto the exposed area of the dowel inside the idler pulley and manually move the pulley back and forth to spread the grease.





Cleaning the Drive Gear

The drive gear is the part of the extruder that pushes filament through the extruder. When you make things with your Replicator 2, small pieces of hardened PLA can stick to the drive gear. If you are having problems with your extruder, cleaning the drive gear might help.

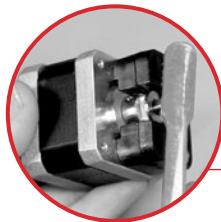
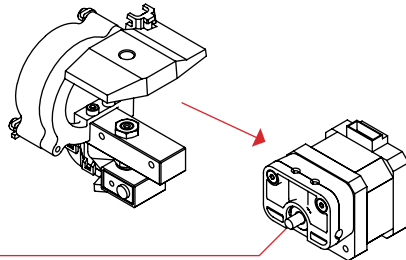
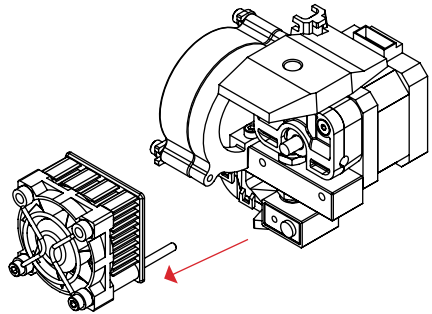
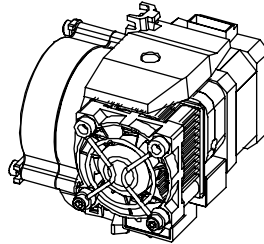
1. Unload the MakerBot PLA Filament from the extruder. To start the script for unloading the MakerBot PLA Filament, go to the LCD panel and select Utilities > Filament Options > Unload.

2. Unscrew the two bolts at the lower corners of the fan guard using the 2.5 mm hex key included with your MakerBot Replicator 2 Desktop 3D Printer. As one piece, remove the fan guard, the fan, the heat sink, and spacers. Keep these pieces together and set them aside.

3. Unclip the motor wires.

4. Pull the motor assembly out.

5. Find the drive gear on the motor shaft. Using a small instrument like a makeup brush, toothbrush or toothpick, remove all the pieces of filament stuck to the drive gear.





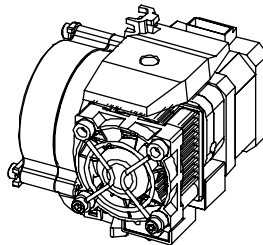
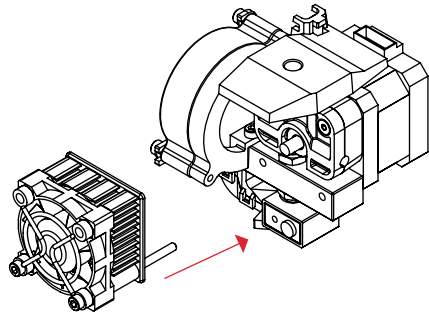
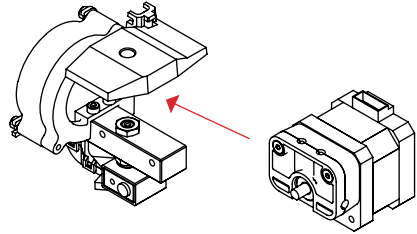
Cleaning the Drive Gear | Continued

6. Reseat the motor assembly.

7. Plug in the motor wires.

8. Add the fan guard, the fan, the heat sink, and spacers to the front of the extruder and bolt them on.

9. Reload the MakerBot PLA Filament. To do this, go to the LCD panel and select Utilities > Filament Options > Load.

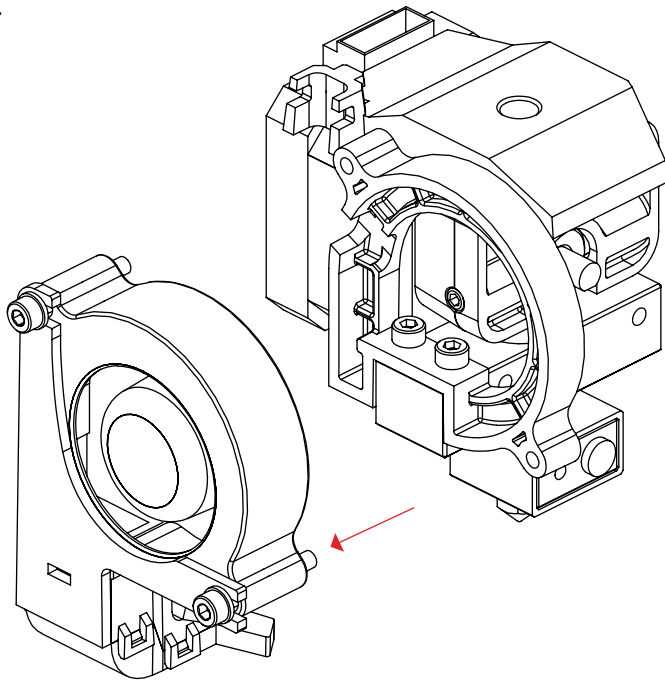




Adjusting the Plunger

After 100 or more hours of printing, you might need to adjust the plunger in the extruder assembly. The plunger pushes the MakerBot PLA Filament against the drive gear. If the plunger wears down and is no longer putting pressure on the MakerBot PLA Filament, the MakerBot Replicator 2 may stop extruding. You can solve this problem by making a small adjustment to the plunger.

1. Unbolt the active cooling fan. The active cooling fan is located on the left side of the extruder. Use the 2.5mm hex wrench included with your Replicator 2 to remove the two bolts that attach the active cooling fan to the extruder.





Adjusting the Plunger | Continued

2. After you've removed the bolts, move the active cooling fan to the side. Push the fan wire out of the way so you have a clear view of the black plastic drive block.

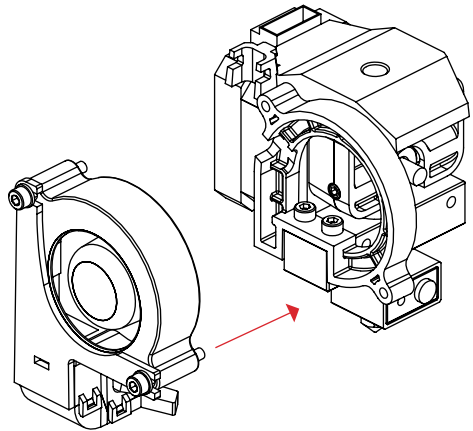
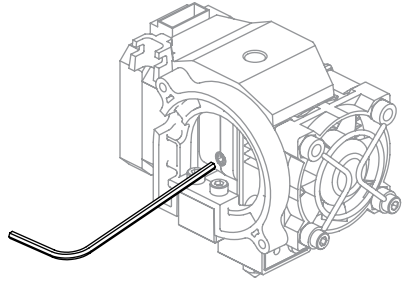
3. Locate the small round hole in the drive block. Insert the 2mm hex wrench included with your Replicator 2 into the hole until you feel it seat itself in the set screw inside.

4. Turn the hex wrench very slightly clockwise, no more than an eighth of a turn.

5. Remove the hex wrench.

6. Reseat the active cooling fan, being careful of the fan wires.

7. Use the 2.5mm hex wrench to bolt the active cooling fan onto the extruder.



Open a Support Ticket

Sometimes a new issue comes up that isn't in the User Manual. The experts on our Support Team can help walk you through it. Open a ticket by emailing support@makerbot.com.

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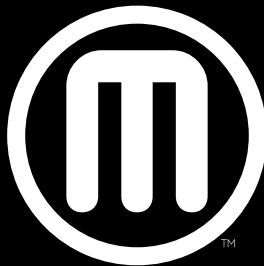
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