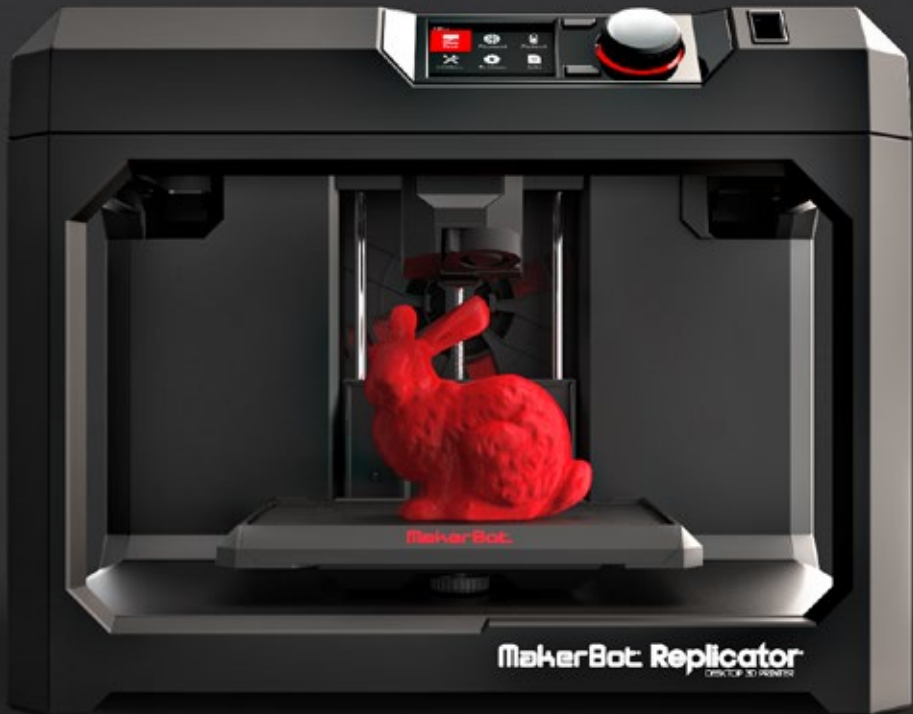


# MakerBot® Replicator®

DESKTOP 3D PRINTER

—— USER MANUAL ——



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# **WELCOME.**

## LET'S GET STARTED.

Welcome to the User Manual for the MakerBot® Replicator® Desktop 3D Printer (Fifth Generation Model). The fifth generation MakerBot Replicator is super easy to use, but it's also packed with brand-new features, so even if you've used a MakerBot Desktop 3D Printer before, be sure to read this manual all the way through.

# SAFETY AND COMPLIANCE

---

Now, before we get going, let's review some important safety information.

## RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under FCC rules.

## MANUFACTURER

MakerBot Industries, LLC  
One MetroTech Center, 21st Floor  
Brooklyn, NY 11201  
347.334.6800



# SAFETY AND COMPLIANCE

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**Safety alert symbols** precede each safety message in this manual. These symbols indicate potential safety hazards that could harm you or others or cause product or property damage.

---



**Warning:** The MakerBot Replicator generates high temperatures. Always allow the MakerBot Replicator to cool down before you reach inside.



**Warning:** The MakerBot Replicator includes moving parts that can cause injury. Never reach inside the MakerBot Replicator while it is in operation.



**Warning:** There is a risk of shock. This product is not user serviceable.



**Warning:** Do not leave the MakerBot Replicator unattended during operation.



**Caution:** Do not print using materials that have not been approved by MakerBot for use with the MakerBot Replicator. Refer to the Specifications section on page 52 for more information.



**Caution:** The socket outlet must be located near the equipment and must be easily accessible.



**Caution:** In case of emergency disconnect the MakerBot Replicator from the wall socket.



**Caution:** The MakerBot Replicator melts plastic during printing. Plastic odors are emitted during this operation. Make sure to set up the MakerBot Replicator in a well-ventilated area.

# ABOUT THE MAKERBOT REPLICATOR

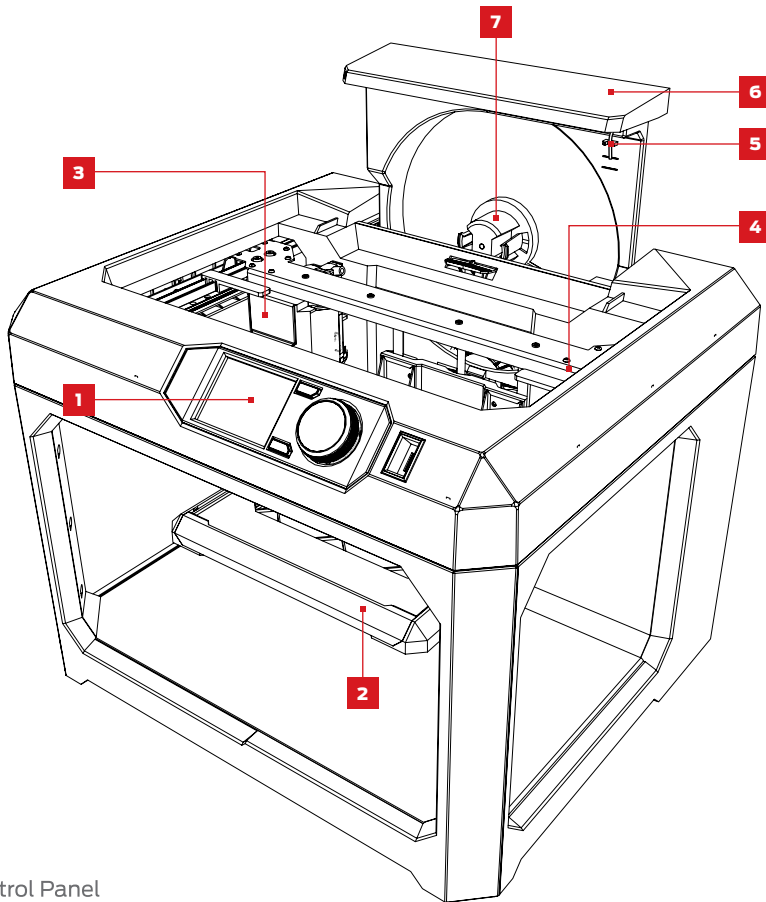
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## HOW IT WORKS

The MakerBot Replicator makes solid, three-dimensional objects out of melted MakerBot PLA Filament. First, use MakerBot Desktop to translate 3D design files into instructions for the MakerBot Replicator. Then transfer those instructions to the MakerBot Replicator via USB drive, USB cable, or your local network. The MakerBot Replicator will melt MakerBot PLA Filament and squeeze it out onto the build plate in thin lines to build your object layer by layer. This method of 3D printing is called fused deposition modeling.

# ABOUT THE MAKERBOT REPLICATOR

## MAKERBOT REPLICATOR DIAGRAMS



**1.** Control Panel

**2.** Build Plate

**4.** Gantry

**6.** Filament Drawer

**3.** Extruder Assembly

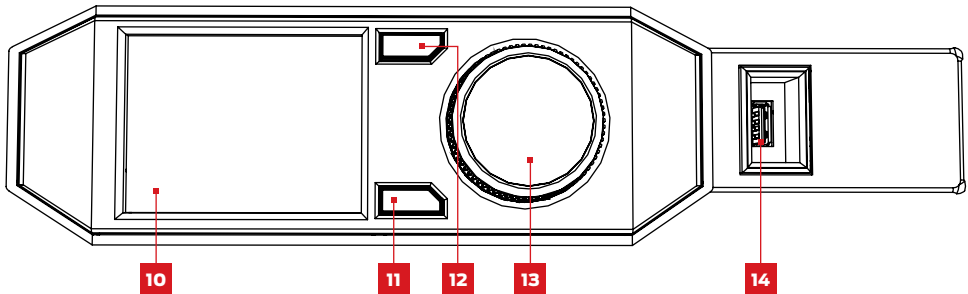
**5.** Filament Guide Tube

**7.** Filament Spindle



# ABOUT THE MAKERBOT REPLICATOR

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**10.** LCD Screen

**13.** Dial

**11.** Menu Button

**14.** USB Drive Port

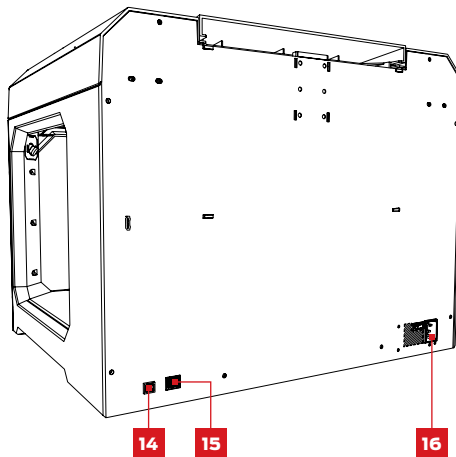
**12.** Back Button

---

**14.** USB Cable Port

**15.** Ethernet Port

**16.** Power Input Port





# GETTING STARTED

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

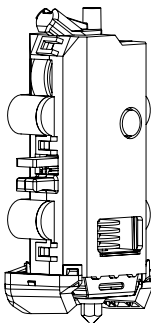
# ACCESSORY CHECKLIST

The accessory tray includes everything you need to use your MakerBot® Replicator® Desktop 3D Printer, including enough MakerBot PLA Filament and blue tape to get you started. To order more MakerBot PLA Filament or blue tape, go to [store.makerbot.com](http://store.makerbot.com)



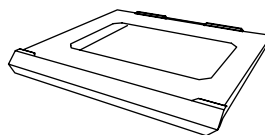
1

**MAKERBOT PRODUCT SAFETY  
INFORMATION BOOKLET**



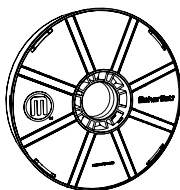
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**MAKERBOT REPLICATOR  
SMART EXTRUDER**



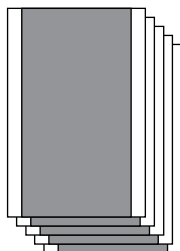
1

**BUILD PLATE**



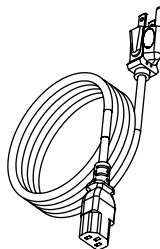
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**LARGE MAKERBOT PLA  
FILAMENT SPOOL [2 LB]**



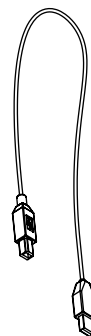
5

**BLUE TAPE**



1

**POWER CORD**



1

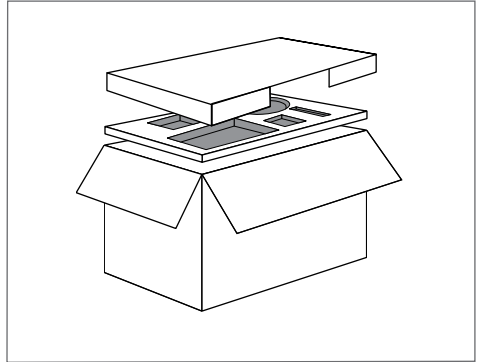
**USB A-TO-B CABLE**

# UNPACKING THE MAKERBOT REPLICATOR

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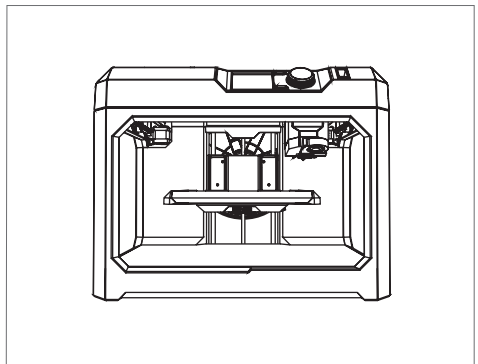
## 1 OPEN THE BOX

Open the box containing your MakerBot Replicator and remove the accessory tray.



## 2 REMOVE THE MAKERBOT REPLICATOR

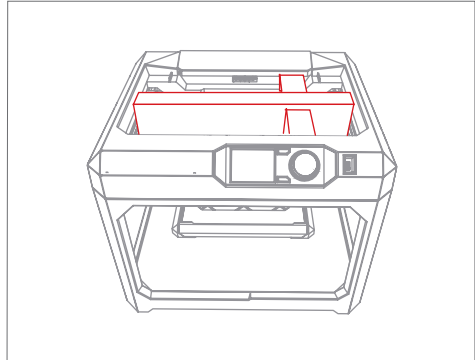
Remove the MakerBot Replicator from its plastic bag and set it down on a stable surface.



# UNPACKING THE MAKERBOT REPLICATOR

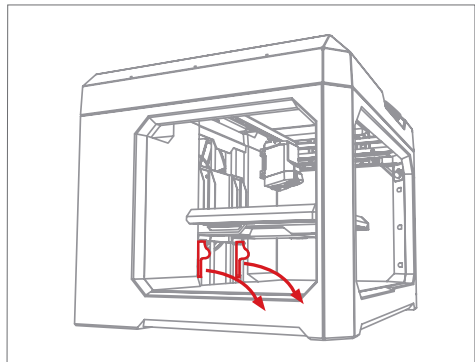
## 3 REMOVE PACKAGING MATERIAL

Remove the foam pieces holding the gantry and extruder carriage in place.



## 4 REMOVE CLIPS

Remove the clips that prevent the build platform from moving during shipping. Save these – they will be handy if you ever need to transport your MakerBot Replicator in the future.

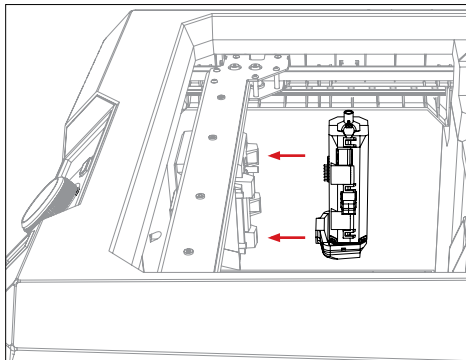


# SETTING UP THE MAKERBOT REPLICATOR

## 1 INSTALL THE MAKERBOT REPLICATOR SMART EXTRUDER

Locate and unwrap the Smart Extruder and press it against the back of the extruder carriage, with the connector pins facing the extruder carriage. Magnets will lock the Smart Extruder into place.

**Note:** If you need to install the Smart Extruder again at any time, go to the control panel and select **Utilities > System Tools > Attach Smart Extruder**.

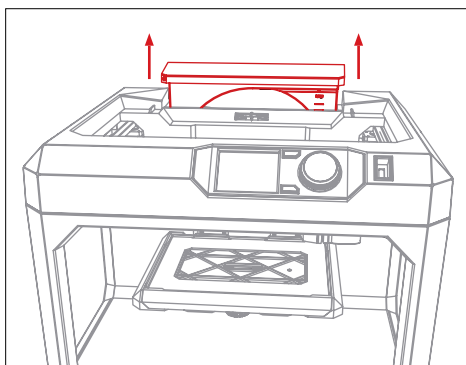


**Caution:** Never remove the MakerBot Replicator Smart Extruder from your MakerBot Replicator during or immediately after printing. Always allow the Smart Extruder to cool completely before removing it from the 3D printer.

## 2 INSTALL THE SPOOL OF MAKERBOT PLA FILAMENT

2a. Locate the MakerBot PLA Filament spool and remove it from its plastic bag.

2b. Grasp the back section of the frame of the MakerBot Replicator and pull upwards to open the filament drawer. Open the drawer all the way.



# SETTING UP THE MAKERBOT REPLICATOR

## 2

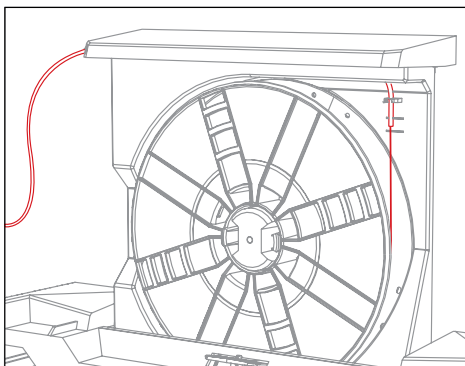
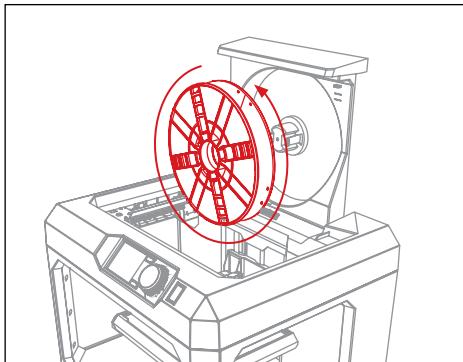
## INSTALL THE SPOOL OF MAKERBOT PLA FILAMENT

2c. Position the filament spool so that it will unwind counterclockwise and fit the spool onto the filament spindle. Be careful not to let the filament loosen or tangle on the spool.

2d. Locate the free end of the spooled filament and insert it into the filament guide tube at the upper right corner of the filament drawer.

2e. Push filament through the tube until the free end emerges from the end of the guide tube where it is taped to the gantry.

2f. Hold the filament drawer open and depress the latch. Then slide the filament drawer closed. Windows in the front of the drawer will let you see how much filament you have left.



# SETTING UP THE MAKERBOT REPLICATOR

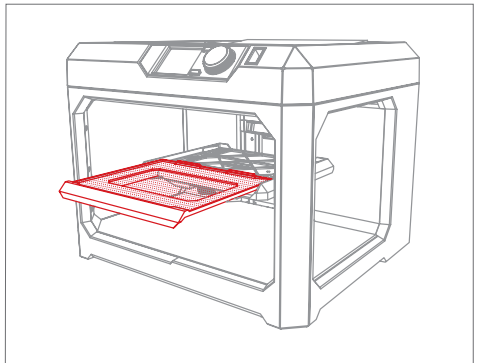
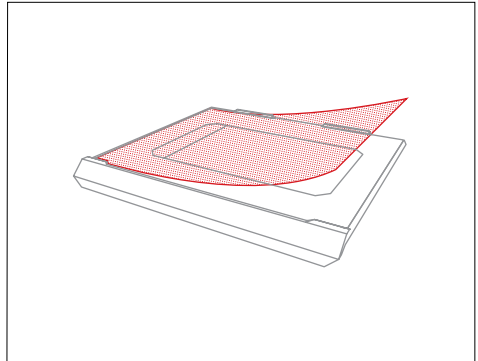
## 3 APPLY BLUE TAPE TO THE BUILD PLATE

3a. Remove the build plate and one sheet of blue tape from the accessory tray.

3b. Peel back about an inch of the tape's backing and orient the tape so that it covers the entire build plate.

3c. Press the exposed tape along one edge of the build plate. Continue to pull away the tape's backing and smooth the tape down until the build plate is completely covered.

3d. Slide the build plate into the slots on the build platform.



**Note:** The blue masking tape used by house painters makes a great surface on which to print objects in PLA. You can find additional build plate-sized sheets of blue tape at [makerbot.com/store](http://makerbot.com/store) or get rolls of blue tape from any hardware store.



# SETTING UP THE MAKERBOT REPLICATOR

## 4

### PLUG IN AND POWER ON

4a. Make sure the power switch is in the Off position.

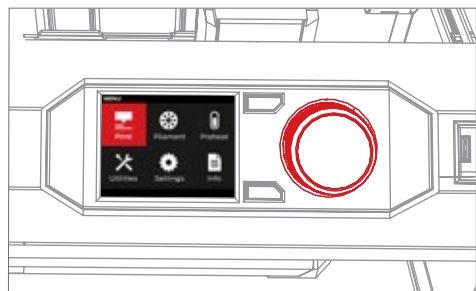
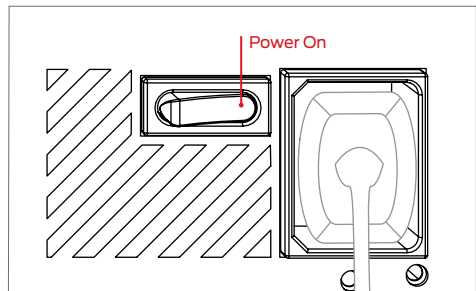
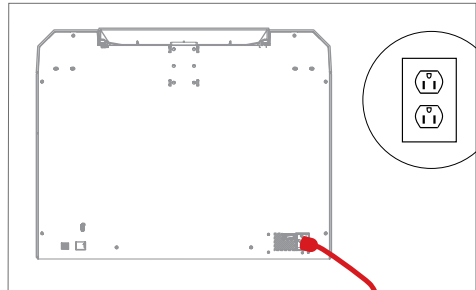
4b. Locate the power cord and plug it into the power input port at the back of the MakerBot Replicator.

4c. Plug the power cord into an electrical outlet.



**Caution:** The socket outlet must be located near the equipment and must be easily accessible.

4d. Switch the power on and press the control panel dial.





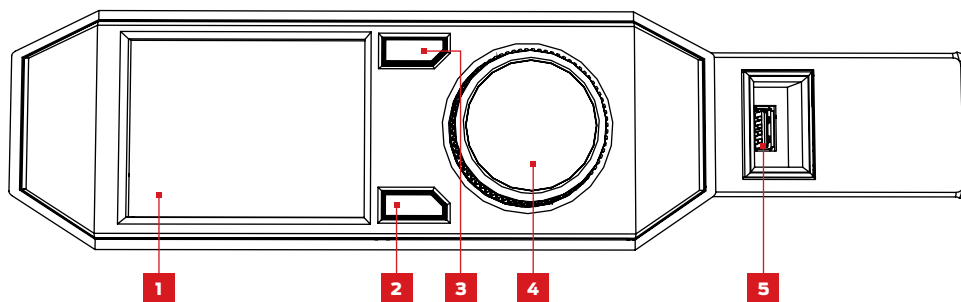
# STARTUP

The first time you turn on your MakerBot® Replicator® Desktop 3D Printer, the LCD screen will start a setup assistant that will introduce you to the control panel, walk you through loading filament and leveling your build plate for the first time, and prompt you to print a preloaded example print. Press the dial to get started.

# THE MAKERBOT REPLICATOR CONTROL PANEL

---

The MakerBot® Replicator® is operated by means of a control panel at the upper right of the machine. The control panel includes a color LCD screen, a rotary/push dial, and two buttons.



**1.** LCD screen

**4.** Dial

**2.** Menu button

**5.** USB drive port

**3.** Back button

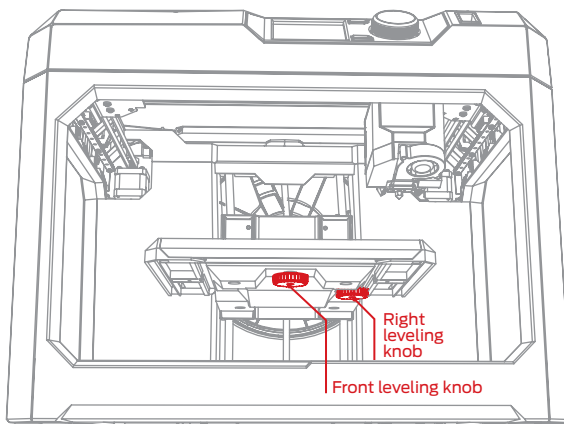
- Turn the dial to scroll through the available options on a screen.
- Press the dial to make a selection.
- Press the back button to return to the previous screen or cancel an action.
- Press the menu button to open a menu with additional options. If a menu is available, a menu icon will appear at the lower right corner of the screen.

# FIRST STEPS

---

## LEVEL THE BUILD PLATE

The build plate is the base on which your prints will form. In order to ensure that your prints always stick to the plate, it must be a set distance from the nozzle of the MakerBot Replicator Smart Extruder. The MakerBot Replicator will guide you through making sure your build plate is at the right distance from the extruder.



During the leveling process:

- Turn the front leveling knob to change the angle of the build plate from front to back.
- Turn the right leveling knob to change the angle of the build plate from side to side.
- When directed, turn the leveling knobs slowly until a light appears on the extruder.
- Press the control panel dial to move to the next step of the leveling process.

The extruder will move to different points around the build plate to make sure the plate is at the appropriate distance from the Smart Extruder nozzle. Turn the leveling knobs according to the instructions that appear on the LCD screen.

**i Note:** You can access the leveling process at any time by choosing the **Utilities** menu on the control panel's home screen and then selecting **Level Build Plate**.

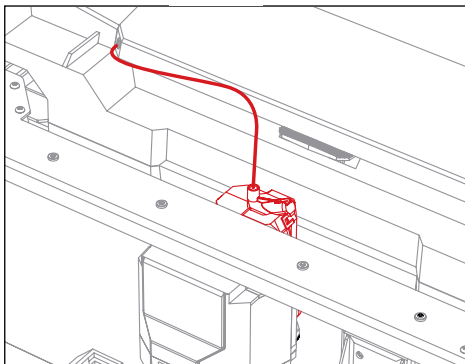
# FIRST STEPS

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## LOAD FILAMENT

Your MakerBot Replicator uses 1.75 mm diameter PLA filament to create 3D printed objects. Once your spool of MakerBot PLA Filament is loaded into the filament drawer at the back of the MakerBot Replicator, all you have to do is load the free end of the spooled filament into the MakerBot Replicator Smart Extruder.

1. Press the control panel dial.
2. When the Smart Extruder is fully heated, grasp the top of the extruder assembly and push the free end of filament into the loading tube at the top of the Smart Extruder . Keep pushing on the filament until you feel the Smart Extruder pulling it in.
3. Wait until you begin to see plastic emerging from the extruder nozzle. Then press the control panel dial to stop extrusion.
4. Wait a moment for the Smart Extruder plastic to cool, then pull it away from the Smart Extruder. Do not touch the nozzle; it may still be hot.



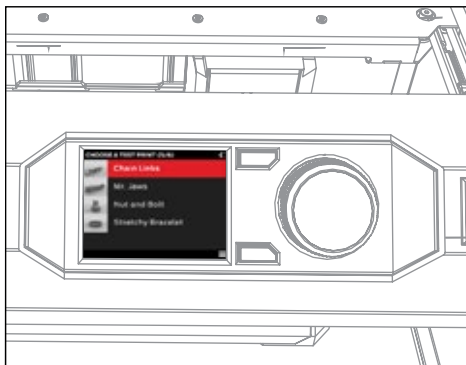
# FIRST STEPS

---

## PRINT A TEST OBJECT

Now that you've leveled your build plate and loaded filament into the extruder, you're ready to print something. The LCD panel will display some of the print files loaded onto your 3D printer's internal storage.

1. Use the dial to highlight one of the print files.
2. Push the dial to select your chosen print. You will be taken to a file info page.
3. Select **Print**. The MakerBot Replicator will print the file you selected.
4. When the print is finished, let it cool before removing it from the build plate.



 **Caution:** Never turn off the MakerBot Replicator immediately after completing a print. Always allow the Smart Extruder to cool before powering down.

# FIRST STEPS

---

## CONNECT TO YOUR COMPUTER

There are three ways to move files from your computer to your MakerBot Replicator: USB cable, Ethernet, and USB drive.

### To connect via USB cable:

1. Remove the USB cable from the accessory box.
2. Insert the USB-B end of the cable into the port on the back of your MakerBot Replicator and insert the USB-A end of the cable into a USB port on your computer.

### To connect via Ethernet:

1. Locate an Ethernet cable (not included).
2. Connect one end of the cable to the Ethernet port at the back of the MakerBot Replicator. Connect the other end to a wall jack or router used by your local area network.

### To connect via USB drive:

No additional setup is required. See Chapter 4 for instructions on exporting print files.

Once you're connected, download MakerBot Desktop to complete setup of your MakerBot Replicator.



**Note:** Your MakerBot Replicator 3D Printer is also set up for built-in Wi-Fi connectivity. We will be enabling onboard Wi-Fi with a firmware update soon.



# MAKERBOT DESKTOP

MakerBot® Desktop is a free app for preparing 3D prints and managing your 3D content. Whether you print directly to the MakerBot Replicator® Desktop 3D Printer via USB cable or Ethernet or you export your print files to a USB drive, MakerBot Desktop is where all of your prints will begin.



# DOWNLOADING AND INSTALLING MAKERBOT DESKTOP

---

1. Open a browser session and go to [makerbot.com/desktop](https://makerbot.com/desktop).
2. Select your operating system from the dropdown menu and click **Download**.  
A system-specific installer will download to your computer.
3. Double-click the MakerBot Desktop installer to run the installation wizard.  
Follow the installation instructions.
4. When you open MakerBot Desktop for the first time, you will be asked to log in.
  - If you have a MakerBot Thingiverse™ account or a MakerBot Store account, you already have a username and password. If not, you can create one now.
  - This is your MakerBot account, and you can use it to log into MakerBot Desktop, Thingiverse, and other MakerBot sites.
  - You can use MakerBot Desktop without logging in, but logging in will allow you to access your MakerBot Cloud Library and additional features in the Explore, Prepare, and Store sections.
5. Select how you will connect your MakerBot Replicator to your computer.
  - **If you will connect via USB**, ensure that your USB cable is connected to your MakerBot Replicator and to your computer. MakerBot Desktop will automatically detect your MakerBot Replicator. Give your MakerBot Replicator a name and choose whether or not you will sync your MakerBot Cloud Library to proceed.
  - **If you will connect via LAN**, ensure that an Ethernet cable is connected to your MakerBot Replicator and to a wall jack or router. MakerBot Desktop will automatically detect your MakerBot Replicator. Choose your MakerBot Replicator from the list of MakerBot 3D printers on your network. Give your MakerBot Replicator a name and choose whether or not you will sync your MakerBot Cloud Library to proceed.
  - **If you will print only via USB drive**, click **Skip**. You will be asked to choose a MakerBot 3D printer. Choose **Replicator (Fifth Generation)**.

You can change which method you use to connect to your MakerBot Replicator at any time. You're now set up and ready to print!

# PRINTING FROM MAKERBOT DESKTOP

---

## HOW IT WORKS

MakerBot Desktop consists of four sections: Explore, Library, Prepare and Store.

**Explore** gives you access to Thingiverse and the hundreds of thousands of 3D printable objects designed by the Thingiverse community. Use Explore to search Thingiverse for inspiration or new things to print, then save them to your collections or prepare them for printing.

**Library** gives you access to your MakerBot Cloud Library and helps you organize your 3D model files. Use it to access things you've collected on Thingiverse or bought from the MakerBot Digital Store as well as your own models.

**Prepare** is where you will turn 3D models into print files. Bring 3D models into the Prepare screen to manipulate them on a virtual build plate. Then specify print options and send print files to your MakerBot Replicator.

**Store** lets you buy print files for premium 3D models. The MakerBot Digital Store sells original, fun, and collectible digital content specifically designed for MakerBot Replicator Desktop 3D Printers. When you buy a model in the MakerBot Digital Store, a print file for your MakerBot Replicator will be added to your MakerBot Cloud Library.

Use Store and Explore to find 3D models, Library to keep them organized, and Prepare to send them to your MakerBot Replicator for printing.

# PRINTING FROM MAKERBOT DESKTOP

---

## FINDING A 3D MODEL

Every 3D print starts with a 3D model. If you design a 3D model yourself, export it from your 3D modeling application in STL or OBJ format. If you don't have a 3D model, download one from Thingiverse, either through the website at [thingiverse.com](http://thingiverse.com) or through the Explore tab in MakerBot Desktop.

- To open a model from Thingiverse, go to the Explore tab, locate the Thing you want to print, and click **Prepare** to open it in the Prepare tab.
- To open a model saved in your Library, go to the Library tab and select a folder to browse. Mouse over a list item to show a menu icon. Click the icon and select **Prepare** to open the model in the Prepare tab.
- To open a file saved to your local computer, go to the Prepare tab, click **Add File**, and navigate to the location of the saved file. Select the file and click **Open** to import it into MakerBot Desktop.

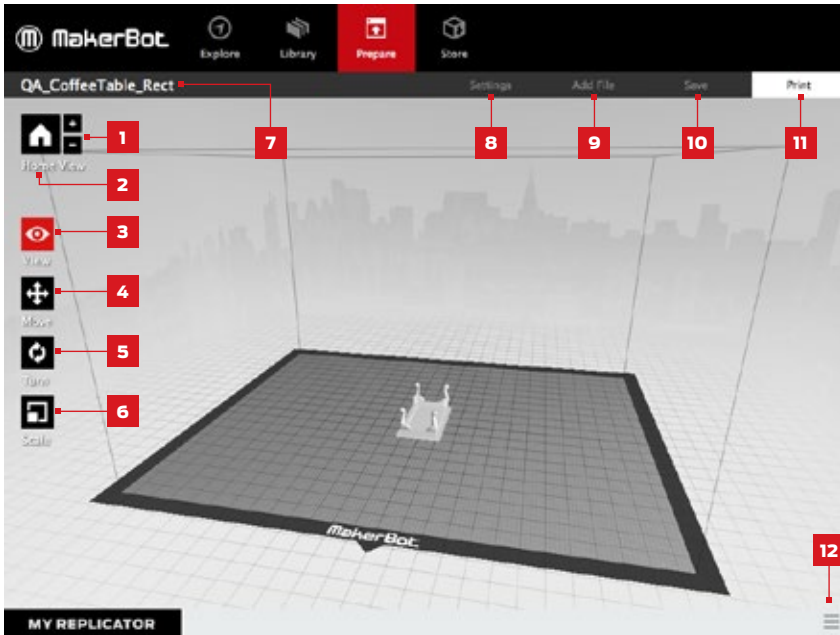
Let's download an example object through the Explore tab.

1. Click **Explore** tab at the top of the MakerBot Desktop screen.
2. Type "Queen Anne coffee table" into the search bar and press **Enter**. One of the results will be Miniature Queen Anne Coffee Tables. Click the image to go to the Thing page.
3. On the Miniature Queen Anne Coffee Tables page, click **Prepare**.
4. You will be shown a list of available files. Next to each listed file is a **Prepare** button. Click Prepare next to the QA\_CoffeeTable\_Rect.stl file. MakerBot Desktop will download your file and open it in the **Prepare** tab.

# PRINTING FROM MAKERBOT DESKTOP

## PREPARING TO PRINT

You should now see the Queen Anne coffee table model at the center of a gray rectangle. This is MakerBot Desktop's representation of your 3D printer's build plate. Let's take a look at the other features visible on the Prepare screen.



### 1. +/-

- Click the **Plus** and **Minus** buttons to zoom in and out.
- You can also zoom using a track pad or the scroll wheel on your mouse.

### 2. Home

- Click the **Home** button to reset MakerBot Desktop to the default view of the build plate.

# PRINTING FROM MAKERBOT DESKTOP

---

## 3. View

- Click the **View** button or press the V key to go into View mode.
- In View mode, click and drag with your mouse to rotate the build plate.
- In View mode, hold the Shift key and click and drag with your mouse to pan.
- Click the **View** button again to open the Change View submenu and access preset views.

## 4. Move

- Click the **Move** button or press the M key to go into Move mode.
- In Move mode, click and drag with your mouse to move your model around on the build plate.
- In Move mode, hold down the Shift key and click and drag with your mouse to move your model up and down along the z-axis.
- Click the **Move** button again to open the Change Position submenu and center your object or move it by a specific distance along the x-, y-, or z-axis.

## 5. Turn

- Click the **Turn** button or press the T key to go into Turn mode.
- In Turn mode, click and drag with your mouse to rotate your model around the z-axis.
- Click the **Turn** button again to open the Change Rotation submenu and lay your object flat or rotate it by a specific number of degrees around the x-, y-, or z-axis.

## 6. Scale

- Click the **Scale** button or press the S key to go into Scale mode.
- In Scale mode, click and drag with your mouse to shrink or enlarge your model.
- Click the **Scale** button again to open the Change Dimensions submenu and scale your object by a specific amount along the x-, y-, or z-axis.

## 7. File Name

- The file name bar displays the name of the file or layout currently open. Thing files can include multiple layouts, or arrangements of models on the plate.

## 8. Settings

- Click **Settings** to open the settings dialog.
- Use the dialog to change print settings for the current object or layout.

# PRINTING FROM MAKERBOT DESKTOP

---

## 9. Add File

- Click **Add File** to open an Open File dialog.
- Navigate to the location of any STL, OBJ, or Thing file and select the file to add a model to the build plate.
- You can add as many models to the plate as will fit. Use the keyboard shortcut Ctrl/Command + L to automatically arrange multiple models on the plate.
- Duplicate models already on the plate using the **Copy** and **Paste** options in the **Edit** menu or the keyboard shortcuts Ctrl/Command+C and Ctrl/Command+V.

## 10. Save

- Click **Save** to open a Save dialog.
- If you are logged into your MakerBot account, you can choose to save an STL or Thing file to your Library or to your local computer. See [makerbot.com/support](http://makerbot.com/support) for more information on your MakerBot Cloud Library.
- If you are not logged into your MakerBot account or if you are working offline, you will be able to save your file only to your local computer.
- If you are working in an existing Thing file, you can rearrange the models on the plate and save this new layout to the Thing file without overwriting earlier layouts.

## 11. Print

- Click **Print** to send a print file to your MakerBot Replicator.
- If MakerBot Desktop is not connected to your MakerBot Replicator, use the Print button to export a print file.
- You can also print or export print files by going to the **File** menu and choosing **Print** or **Export > Export Print File**.

## 12. Status

- The status bar displays the connection status of any connected MakerBot 3D Printer.
- It also displays print progress.
- Click to open a print monitor panel.
- The print monitor panel displays more detailed information about any connected MakerBot 3D Printer and a camera view of any print in progress.

The Queen Anne coffee table model should print well at its default size and position, but you can also choose to manipulate it before proceeding.

# PRINTING FROM MAKERBOT DESKTOP

## PRINT SETTINGS

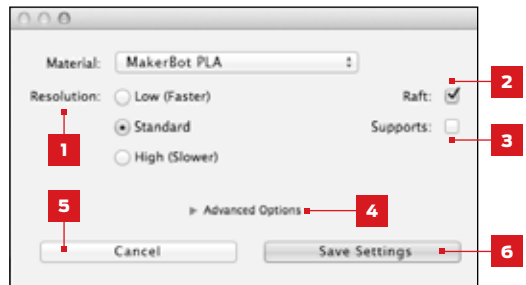
If you want to change any settings before printing, click **Settings**. This is where you can specify options that will affect the quality of your printed object, like print resolution and object strength.

To print with standard or previously specified settings, skip this step and go straight to printing.

### 1. Resolution

Choose **Low**, **Standard**, or **High** resolution to specify the surface quality of your 3D print.

- Objects sliced with the Standard resolution profile will be printed using the default settings. Standard resolution prints will print quickly and have good surface quality.
- Objects sliced using the Low resolution profile will be printed with thicker layers and will print faster.
- Objects sliced with the High resolution profile will have finer layers and will print more slowly.



For this print of the Queen Anne coffee table, select **Standard**.

### 2. Raft

Select this checkbox to have your object built on a raft. The raft acts as a base for your object and any support structures, and ensures that everything adheres well to the build plate. The raft will be easily removable once you remove your finished object from the build plate. For this print of the Queen Anne table, make sure the Raft checkbox is selected.

### 3. Supports

Select this checkbox to have your object printed with support structures. MakerBot Desktop will automatically generate supports for any overhanging sections of your object. Supports will be easily removable once you remove your finished object from the build plate. You will not need support structures to print the Queen Anne coffee table, so make sure the box is not checked.

# PRINTING FROM MAKERBOT DESKTOP

---

## PRINT SETTINGS

### 4. Advanced

Click **Advanced** for additional options, including temperature and object strength. For information on what the advanced settings are and how to use them, go to [makerbot.com/support](http://makerbot.com/support). You will not need to change any advanced settings to print the Queen Anne coffee table.

### 5. Cancel

Click **Cancel** to return to the Prepare screen without saving changes. Any print settings you have selected will be discarded.

### 6. Save Settings

When you are finished, click **Save Settings**. The current settings will be used to slice your model next time you print or export a print file.

## PRINTING TO THE MAKERBOT REPLICATOR

When you are ready to print the Queen Anne coffee table model, click **Print** to slice the model using the current settings and send a .makerbot print file to your MakerBot Replicator.

- If MakerBot Desktop is connected to your MakerBot Replicator, the print file will be sent directly to your 3D printer. Click the control panel dial to confirm and start your print.
- If MakerBot Desktop is not connected to your MakerBot Replicator, this button will open a dialog allowing you to save a .makerbot print file. You can transfer the print file to your MakerBot Replicator using a USB drive or print it from your Library at a later time.
- Click **Print Preview** to open a preview of the sliced model.



# CAMERA

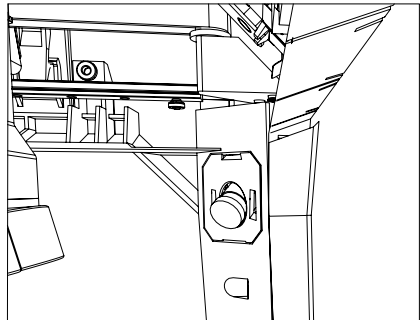
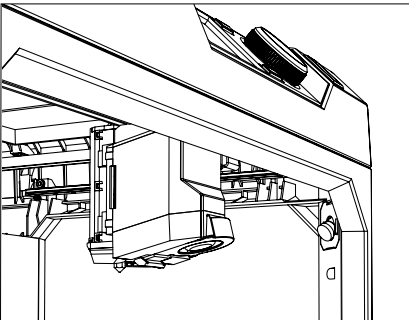
---

A feed of images from the onboard camera is always available when you're connected to your MakerBot Replicator. To view the feed, click the menu icon at the right side of the status bar to open the monitor panel. As long as you are connected to your MakerBot Replicator via a local area network, the camera image will refresh every few seconds.

When you connect your new MakerBot Replicator to MakerBot Desktop for the first time, the camera image may be blurry. You will need to focus it manually to get the best image possible.

## To focus the camera:

**1.** Connect the MakerBot Replicator to MakerBot Desktop using a local area network and click the status bar to open the monitor panel.



**2.** Locate the camera. It is mounted inside the right front corner of the MakerBot Replicator.

**3.** Grasp the plastic ring around the lens and twist it slightly. Avoid touching the camera lens itself.

**4.** Check the camera feed and wait for the image to refresh. If the image is clearer than it was before, continue twisting the lens in the same direction. If the image is less clear, start twisting the lens in the opposite direction.

**5.** Twist in small increments, and check the camera feed frequently. When the image is clear and twisting in either direction makes it more blurry, stop making adjustments. You have successfully focused the onboard camera.



# THE CONTROL PANEL

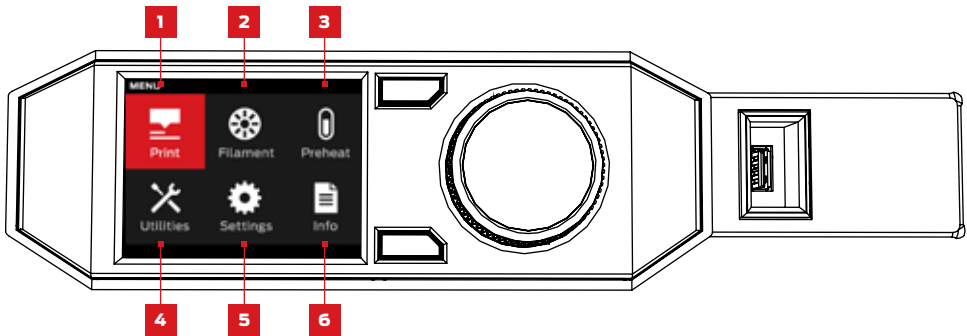
The control panel on your MakerBot® Replicator® Desktop 3D Printer allows you to interact with your 3D printer. You can use it to initiate prints, edit settings, and access information. This chapter describes the different things you can do with the control panel.

# HOME SCREEN

---

Use the control panel to:

- Print objects from a USB flash drive or the internal storage of your MakerBot Replicator.
- Start prints initiated via MakerBot Desktop.
- Change printer settings.
- View print history and statistics.



**1. PRINT:** Initiate a print stored on a USB drive or internal storage, or synced from your MakerBot account.

**2. FILAMENT:** Load filament into or unload filament from the MakerBot Replicator Smart Extruder.

**3. PREHEAT:** Preheat the Smart Extruder.

**4. UTILITIES:** Access build plate leveling, diagnostics and other tools.

**5. SETTINGS:** Edit network and sharing settings and personalize your MakerBot Replicator.

**6. INFO:** View your 3D printer's history and statistics.

# PRINT

---

Select the Print icon to initiate a print stored on a USB flash drive or on your 3D printer's internal storage.

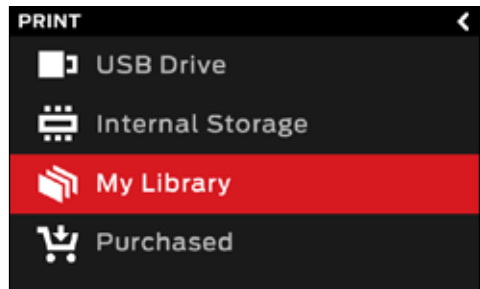
1

## SELECT A FILE

Turn the dial to scroll through the list of available locations. Push the dial to select the location of the file you want to print.

Select **USB Storage** to print a file stored on a USB drive inserted into the USB port.

Select **Internal Storage** to print a file stored on the MakerBot Replicator. The internal storage has a capacity of about 2 GB.



Select **Your Library** to print a sliced file from your MakerBot Cloud Library. In the Library menu:

- Choose **All Things** to access every item synced to your MakerBot Replicator from your Library.
- Choose **My Designs** for private files synced from your MakerBot Cloud Library.
- Choose **Thingiverse** for items from your MakerBot Thingiverse™ collections.
- Choose **Purchased** for files purchased from the MakerBot Digital Store.

Press the dial to select a location. Turn the dial to scroll through the list of available files and press it again to select one.

# PRINT

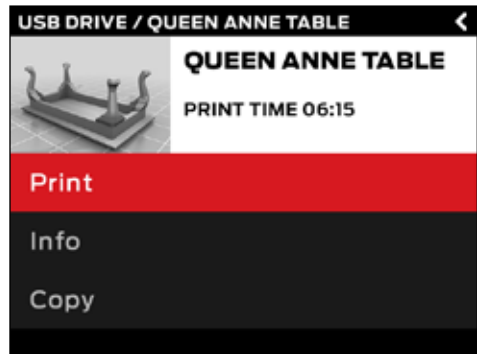
---

## 2 START PRINT

- If you select a file from the USB drive or internal storage, the control panel will display the file screen.
- If you select something from your MakerBot Cloud Library, you will see a list of all the layouts associated with the file. Scroll through the available layouts and select one in order to go to the file screen.

### From the file screen, choose what to do with the part or layout:

- Select **Print** to start printing the file.
- Select **Info** for more information on the part or layout. Turn the dial to toggle between three information screens.
- Select **Copy** to copy a file to internal storage or to an attached USB drive.



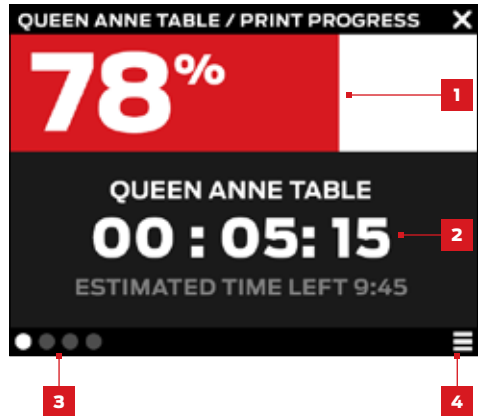
# PRINT

---

## PRINTING

During a print, you will be able to view print progress information as well as other details about your print.

1. Percentage of the print completed.
2. Time elapsed and estimated time remaining in the print. While the Smart Extruder is heating, this area will display the current and target temperatures.
3. Location in active print screens. Turn the dial to scroll between the following screens:



- Print progress
  - Rendering of your model or layout
  - File information
  - Print options information
4. Print Menu. Press the control panel's Menu button to open the Print menu. The Print menu contains the following options:
    - **Pause.** Select this option to temporarily pause your print. You can also pause by pressing the control panel dial.
    - **Change Filament.** Select this option to pause your print and go directly to the Filament menu.
    - **Take a Picture.** Select this option to take a picture of the build area with the MakerBot Replicator Desktop 3D Printer's built-in camera. The picture will be saved to internal storage.
    - **Set Pause Height.** Select this option to set your print to pause at a predetermined height.
    - **Cancel.** Select this option to cancel your print. You can also cancel a print by pressing the back button.

# PRINT

---

3

## PRINT COMPLETE

If you are printing a file from Thingiverse, you will be prompted to share a photo. Photos shared to Thingiverse will appear on the Thing page in the I Made One! section. Sharing a photo is a nice thing to do – other Thingiverse users will love to see how your prints of their designs come out.

To share a photo, select **Share to Thingiverse**. The MakerBot Replicator will take a photograph of your build area. Push the dial again to post the photo to the Thing page.

If you do not wish to share a photo of your print to Thingiverse, select **Back to Menu**. The MakerBot Replicator will send a photograph to the Print History section of your MakerBot Cloud Library.

# FILAMENT

---

Select the **Filament** icon to load or unload filament.

## To load filament:

1. Use the dial to select **Load Filament**.
2. Wait for the Smart Extruder to heat.
3. Cut the end of your filament to create a clean edge.
4. Grasp the top of the extruder assembly and push the filament into the Smart Extruder's loading tube until you can feel the motor pulling the filament in.

## To unload filament:

1. Use the dial to select **Unload Filament**.
2. Wait for the Smart Extruder to heat.
3. Allow the Smart Extruder to unload the filament.
4. When the Smart Extruder has stopped pushing the filament out, gently pull the filament free. If you are changing filament spools, be careful to keep the spool tightly wound as you pull the filament free of the guide tube. If you do not, the filament could unravel or tangle on the spool.



## PREHEAT

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Select the **Preheat** icon to preheat your Smart Extruder. When you select Preheat, the Smart Extruder will immediately start heating. The current and target temperatures will be visible on the main screen.

## UTILITIES

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Use the Utilities menu to access plate leveling, diagnostics and other tools.

### LEVEL BUILD PLATE

Select to begin the assisted leveling process. For best results when leveling, make sure the extruder nozzle is clean and wipe any plastic debris off of the build plate.

### CAMERA

Select to access options related to your 3D printer's built-in camera. In the camera menu, you can:

- Take a photo of the build area using the built-in camera.
- Browse photos taken by the built-in camera.
- Copy photos to the USB drive.
- Erase all photos taken with the built-in camera to date.

# UTILITIES

---

## SYSTEM TOOLS

Additional options are available under System Tools.

### HOME POSITION

Select to move the build platform and extruder assembly to their home positions. The build platform will move all the way down and the extruder carriage will move to the front left corner of the MakerBot Replicator.

### ATTACH SMART EXTRUDER

Select for assistance in attaching the MakerBot Replicator Smart Extruder.

### DIAGNOSTICS

Select to run a diagnostic sequence or to copy recent diagnostics logs to the USB drive. If the diagnostic sequence flags any issues, please contact MakerBot Support by emailing [support@makerbot.com](mailto:support@makerbot.com)

### SYSTEM LOGS

Select to clear the MakerBot Replicator's log files or copy them to a USB drive.

### RESTORE FACTORY SETTINGS

Select to return all settings on your MakerBot Replicator to the factory defaults.

### POWER OFF

Select to turn your MakerBot Replicator off. After you turn the MakerBot Replicator off by selecting this option, you will be able to turn it back on by pushing the control panel dial.

# SETTINGS

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Use the Settings menu to edit network and sharing settings and to personalize your MakerBot Replicator.

## NETWORK SETTINGS

- **Network Info.** Select for information about your network connection.

## MAKERBOT ACCOUNT

- **Unlink Account.** Select to unlink your MakerBot account from the MakerBot Replicator. You will not be able to share to Thingiverse or print items from your MakerBot Cloud Library when logged out.

## OTHER SETTINGS

- **Name.** Select to change the name used to represent your MakerBot Replicator.
- **Sound.** Select to turn nonessential sound effects off or on.

# INFO

---

Use the Info menu to view your 3D printer's history and statistics.

## **FIRMWARE**

View the version number of the firmware currently installed on your MakerBot Replicator.

## **HARDWARE**

Select to view machine serial numbers, network ID and the current temperature of the MakerBot Replicator Smart Extruder.

## **STATISTICS**

Select to view printing statistics, including total print time and the amount of space available in internal storage.

## **HISTORY**

Select to view recently printed items. Select an individual item from the list to view the date, print time, and quantity of filament used. Press the menu button to change the order of the listed items or to export the list to a CSV file that can be saved to a USB drive.



# TROUBLESHOOTING

As you get to know your MakerBot® Replicator® Desktop 3D Printer, you may run into issues with different parts of the printing process. Here is a handy guide to some simple-to-fix problems. For help with issues not covered in this chapter, go to [makerbot.com/support](http://makerbot.com/support) or contact the MakerBot Support team by emailing [support@makerbot.com](mailto:support@makerbot.com)

# PRINTING PROBLEMS

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| PROBLEM                                                            | SOLUTION                                                                                                                                                                                                                 |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can't load filament into the MakerBot® Replicator® Smart Extruder. | Try unloading and loading again. Hold the Smart Extruder in place and try pushing the filament through. As long as you are holding the Smart Extruder in place, pushing on the filament will not damage it.              |
| Can't remove filament from the MakerBot Replicator Smart Extruder. | Try running the filament load script and allowing plastic to extrude for a few seconds. Then try unloading again.                                                                                                        |
| Filament won't extrude from the Smart Extruder.                    | Try unloading and reloading the filament. You may be able to avoid jams in the future by allowing the Smart Extruder to cool before turning off your MakerBot Replicator.                                                |
| Printed object is stuck to the build plate.                        | If the object is still stuck, take a thin metal craft spatula and carefully work the blade under the object. When the blade is most of the way under the object, twist the handle slightly. The object should come free. |

# PRINTING PROBLEMS

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| PROBLEM                                                            | SOLUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object peels off the build plate during printing.                  | <p>Relevel your build plate. Inconsistent plate height will lead to inconsistent adhesion. If any one part of your object does not adhere well to the build plate, the whole object might peel off of the plate.</p> <p>Ensure that the build plate is clean. Dust and oil from your hands or tears and wrinkles in the blue tape covering the plate can prevent objects from adhering. Wipe down the build plate with a clean, lint-free cloth.</p> <p>If you are printing directly on blue tape, consider using a raft. A raft provides a consistent build surface that even tricky prints will stick to.</p> |
| Touchscreen doesn't respond.                                       | <p>The control panel screen on the MakerBot® Replicator® Desktop 3D Printer is not a touchscreen. Turn the dial to scroll through the available options on the screen. Press the dial to select.</p>                                                                                                                                                                                                                                                                                                                                                                                                            |
| The plate leveling routine does not result in a level build plate. | <p>The assisted leveling routine depends on a clean, flat plate and a clean extruder nozzle. Wrinkles in your blue tape or plastic debris on the build plate or nozzle can interfere with the extruder sensor.</p>                                                                                                                                                                                                                                                                                                                                                                                              |

# CONNECTIVITY PROBLEMS

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| PROBLEM                                                                                                          | SOLUTION                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Can't access the Library, Explore and Store sections of MakerBot Desktop.                                        | You may not be logged into your MakerBot account. These features are only accessible when you are logged in. If you are logged into your MakerBot account but are still unable to access the Library, Store and Explore sections, your computer may not be connected to the internet.                                                                                      |
| The MakerBot Replicator is connected to a network, but MakerBot Desktop will only allow me to export, not print. | You may not have established a connection between MakerBot Desktop and your MakerBot Replicator. In MakerBot Desktop, go to <b>Devices &gt; Connect to MakerBot</b> . Choose your MakerBot Replicator from the list of MakerBot 3D printers on your network and click <b>Connect</b> . When prompted, push the dial on your MakerBot Replicator to confirm the connection. |
| Filament breaks between the spool and the MakerBot Replicator Smart Extruder.                                    | Open the filament drawer and ensure that the filament unwinds counterclockwise. Check that the filament guide tube is not twisted or bent. Make sure to unload the filament left in the Smart Extruder before reloading.                                                                                                                                                   |



# CONNECTIVITY PROBLEMS

| PROBLEM                                                                                                 | SOLUTION                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| The MakerBot Replicator Smart Extruder is installed, but the MakerBot Replicator does not recognize it. | Remove the Smart Extruder and run the extruder attachment script by going to <b>Utilities &gt; System Tools &gt; Change Smart Extruder</b> . |
| Print files don't appear in USB storage or internal storage.                                            | Make sure that your print files are in the appropriate format. Print files for the MakerBot Replicator must have a .makerbot file extension. |
|                                                                                                         |                                                                                                                                              |

If these solutions don't solve your issue, or if you are having a problem that doesn't appear here, please contact MakerBot Support by emailing [support@makerbot.com](mailto:support@makerbot.com). See page 56 for more on how to contact MakerBot Support.

# UPDATING FIRMWARE

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Firmware is the software that runs on your MakerBot Replicator. Keeping your firmware up to date will help ensure that your MakerBot Replicator is in the best possible working order. Firmware updates allow MakerBot to add new features to your MakerBot Replicator and improve old ones.

MakerBot Desktop will let you know if there's a firmware update available. To upgrade to the new version, just select **Upload Firmware** from the **Devices** menu. The software will walk you through the steps to bring your MakerBot Replicator up to date.



REFERENCE

# SPECIFICATIONS

---

## PRINTING

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| Print Technology: | Fused deposition modeling                              |
| Build Volume:     | 25.2 L x 19.9 W x 15.0 H cm [9.9 L x 7.8 W x 5.9 H in] |
| Layer Resolution: | 100 microns                                            |
| Filament:         | 1.75 mm [0.069 in] MakerBot PLA Filament               |
| Nozzle Diameter:  | 0.4 mm [0.015 in]                                      |
| Print File Type:  | .makerbot                                              |

## SOFTWARE

|                      |                                                                   |
|----------------------|-------------------------------------------------------------------|
| Software Bundle:     | MakerBot Desktop Software                                         |
| 3D Model File Types: | .stl, .obj, .thing                                                |
| Supported OS:        | Windows (7+), Mac OS X (10.7+), Linux (Ubuntu 12.04+, Fedora 19+) |

## PHYSICAL DIMENSIONS

|                  |                                                           |
|------------------|-----------------------------------------------------------|
| Printer:         | 52.8 L x 44.1 W x 41.0 H cm [20.8 L x 17.4 W x 16.2 H in] |
| Shipping Box:    | 57.6 L x 52.1 W x 54.6 H cm [22.7 L x 20.5 W x 21.5 H in] |
| Printer Weight:  | 16.0 kg [35.3 lbs]                                        |
| Shipping Weight: | 17.6 kg [38.9 lbs]                                        |

## TEMPERATURE:

|                                |                   |
|--------------------------------|-------------------|
| Ambient Operating Temperature: | 15-32°C [60-90°F] |
| Storage Temperature:           | 0-38°C [32-100°F] |

## ELECTRICAL

|                     |                                          |
|---------------------|------------------------------------------|
| Power Requirements: | 100-240 VAC; 0.76-0.43 A; 50/60 Hz; 100W |
| Connectivity:       | USB, Ethernet, Wi-Fi [coming soon]       |

## MECHANICAL

|                           |                                               |
|---------------------------|-----------------------------------------------|
| Construction:             | PC ABS with powder-coated steel reinforcement |
| Build Surface:            | Glass with blue tape                          |
| Stepper Motors:           | 1.8° step angle with 1/16 microstepping       |
| XY Positioning Precision: | 11 microns [0.0004 in]                        |
| Z Positioning Precision:  | 2.5 microns [0.0001 in]                       |

## CAMERA

|                    |         |
|--------------------|---------|
| Camera Resolution: | 640X480 |
|--------------------|---------|

# GLOSSARY

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**BACK BUTTON:** The button at the top right corner of the control panel's LCD screen. The back button will often allow you to return to a previous screen or cancel an action.

**BLUE TAPE:** Blue masking tape that makes a great build surface for objects printed with MakerBot PLA Filament. You can find blue tape at any hardware store or order sheets of blue tape sized for your build plate at [makerbot.com/store](http://makerbot.com/store).

**BUILD PLATE:** The flat glass plate on which the MakerBot® Replicator® Desktop 3D Printer builds an object.

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

**CONTROL PANEL:** The LCD screen, dial and buttons at the upper right corner of the MakerBot Replicator. The control panel allows you to start prints, change settings and view status information.

**DIAL:** The rotary/push dial on the control panel. Rotate the dial to scroll through available options and push the dial to select.

**ETHERNET CABLE:** A Cat5e cable used to connect your MakerBot Replicator to a local area network.

**EXTRUDER ASSEMBLY:** The MakerBot Replicator Smart Extruder installed in the extruder carriage.

**EXTRUDER CARRIAGE:** The part of the extruder assembly that sits on the gantry and moves back and forth. When the Smart Extruder is installed in the extruder carriage, the extruder assembly is complete.

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

**FILAMENT DRAWER:** The part of your MakerBot Replicator that slides out to allow you to load a spool of MakerBot PLA Filament.

**FILAMENT GUIDE TUBE:** The plastic tube that guides the MakerBot PLA Filament from the filament spool to the Smart Extruder.

**FIRMWARE:** The software that runs on your MakerBot Replicator.

**GANTRY:** The apparatus that allows the extruder assembly to move around.

**INTERNAL STORAGE:** The part of the MakerBot Replicator's onboard storage that you can use to store print files. The capacity of the MakerBot Replicator's internal storage is about 2GB.

# GLOSSARY

---

**LAYOUT:** An arrangement of 3D models on the build plate. Multiple layouts can be saved as part of any Thing in your Library.

**LEVELING KNOBS:** The two knobs underneath the build platform that allow you to pivot the build plate around its center point during the leveling process.

**.MAKERBOT:** The format of print files for your MakerBot Replicator. Print files contain instructions for your MakerBot Desktop 3D Printer.

**MAKERBOT ACCOUNT:** The username and password you will use to sign in to MakerBot Desktop , and log on to Thingiverse and other MakerBot sites.

**MAKERBOT CLOUD LIBRARY:** The part of MakerBot Desktop where you can access your MakerBot Cloud Library and organize your own design files, files downloaded from or collected on Thingiverse™, or files purchased from the MakerBot Digital Store.

**MAKERBOT DESKTOP SOFTWARE:** Free software for use with your MakerBot Replicator Desktop 3D Printer. MakerBot Desktop will help you discover, manage, share and print 3D models.

**MAKERBOT DIGITAL STORE:** A digital store where you can download premium 3D content.

**MAKERBOT PLA FILAMENT:** Polylactic acid filament. PLA is a corn-based thermoplastic. MakerBot PLA Filament is the source material from which you make objects on the MakerBot Replicator.

**MAKERBOT REPLICATOR:** The MakerBot® Replicator® Desktop 3D Printer (Fifth Generation Model).

**MENU BUTTON:** The button at the bottom right corner of the control panel's LCD screen. The menu button will often allow you to open a menu containing additional options.

**.OBJ:** A file format used for 3D models.

**PROFILE:** The settings used to slice your 3D model and create a print file. MakerBot Desktop Software comes with preset profiles for Low, Standard and High resolution prints.

**RAFT:** A plastic base printed on the build plate and used as a printing surface for your printed object.

**SETTINGS DIALOG:** The dialog that allows you to change which print settings will be used when you create a print file.

# GLOSSARY

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**SETUP ASSISTANT:** The set of tasks that runs when you turn on the MakerBot Replicator for the first time. The setup assistant helps you level the build plate, load filament and start a test print. You can access the setup assistant at any time through the Utilities menu.

**SLICING:** The process of turning a 3D model into a print file containing instructions for your MakerBot 3D printer. The MakerBot Replicator uses print files with the extension .makerbot.

**SMART EXTRUDER:** The MakerBot Replicator Smart Extruder draws the filament from the spool, melts it, and pushes it through a nozzle onto the build plate.

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

**SUPPORTS:** Automatically generated support structures used to prop up any sections of a print that will not stand alone.

**.THING:** A file format used by MakerBot Desktop that stores additional information about your 3D model files.

**THING:** A file or group of files saved to Thingiverse or to your MakerBot Cloud Library.

**THINGIVERSE:** MakerBot Thingiverse, an online community for sharing 3D design files.

**USB CABLE:** A cable that allows your computer to communicate with the MakerBot Replicator.

**USB DRIVE:** A USB flash drive. You can use a USB drive to transfer print files to and from the MakerBot Replicator.

# HOW TO USE MAKERBOT SUPPORT

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At MakerBot, we take pride in offering expert, responsive, friendly customer support to all of our customers around the world. When you email or call us, there are a few things you can do ahead of time to help us help you.

## **HAVE YOUR SERIAL NUMBER READY.**

The serial number helps us to quickly look up your order and get more complete information on your MakerBot Replicator. The serial number is located on a label on the right side of your MakerBot Replicator.

## **IF YOU ARE CONTACTING US VIA EMAIL, BE AS THOROUGH AS POSSIBLE.**

Please provide as much information as possible about your issue in your initial email. The more information we have, the more accurately we can identify your issue.

## **SEND A PHOTO OR VIDEO.**

Many issues are easier to diagnose with photographs or videos. These kinds of issues include:

- Situations where something is physically damaged or out of place.
- Situations where you believe you understand the issue, but don't know the names of the components involved.
- Situations where your MakerBot Replicator is behaving in a way that may be difficult to describe.
- Print quality issues.

If you don't have a camera handy, you can always use the one on your MakerBot Replicator. To take a photo, just go to **Utilities > Camera > Take a Picture**. Then copy it to a USB drive and move it to your computer.



# CONTACT

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|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Support</b>  | <p><b>makerbot.com/support</b></p> <p>Our website has extensive documentation and troubleshooting information about your MakerBot Replicator. It's a great resource when you want to try to solve issues quickly on your own.</p> <p><b>support@makerbot.com</b></p> <p>If you ever need help resolving an issue with your MakerBot Replicator, send an email to the address above to open a ticket with the MakerBot Support Team. To help us understand your problem from the start, it is very helpful to include pictures or a video as attachments to your email.</p> |
| <b>Sales</b>    | <p><b>sales@makerbot.com</b></p> <p>To learn about other MakerBot products, including MakerBot PLA Filament, please email the address above, or call our Sales Team at (347) 334-6800.</p>                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Feedback</b> | <p><b>thoughts@makerbot.com</b></p> <p>For general questions, or to tell us what's on your mind, send an email to the address above. We love to hear from you, and using this email address helps keep our Sales and Support lines free for customers in need.</p>                                                                                                                                                                                                                                                                                                         |



TERMS

# TERMS

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Please be advised of the following terms (the “Terms”) regarding this User Manual (this “Manual”):

All information in this Manual is subject to change at any time without notice and is provided for convenience purposes only. MakerBot reserves the right to modify or revise this Manual in its sole discretion and at any time. You agree to be bound by any modifications and/or revisions. Contact the MakerBot Support Team for up-to-date information.

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# TERMS

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**WARRANTY.** The MakerBot Replicator Desktop 3D Printer (Fifth Generation Model) is covered by a Limited Warranty. For terms and conditions, see [makerbot.com/legal](http://makerbot.com/legal)



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