

LULZBOT MINI DEVELOPER'S GUIDE



LulzBot Mini Developer's Guide

by Aleph Objects, Inc.

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Introduction

Welcome Aboard

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Audience

This is a developer's guide to hacking on the LulzBot Mini 3D Printer. It is meant for developers, not users, of the printer.

Open Source Hardware, Free Software

Aleph Objects, Inc. is a Loveland, Colorado, USA company that manufactures Open Source Hardware using Free Software.

For more info, visit <http://www.alephobjects.com>.

LulzBot Mini Developer Overview

1.1 LulzBot Mini

The LulzBot Mini is a 3D Printer currently under development. The abbreviated name is mini-dev.

The source files are available here:
<http://devel.lulzbot.com/mini/>

1.2 Versions

Each new version of the mini-dev has a new name, with the next letter in the alphabet.

- Azalea - First Prototype
- Begonia - Second Prototype, being built now
- Camellia - Third Prototype
- Daffodil - First Production batch

1.3 Begonia Photos

Figure 1.1: Begonia Front Photo

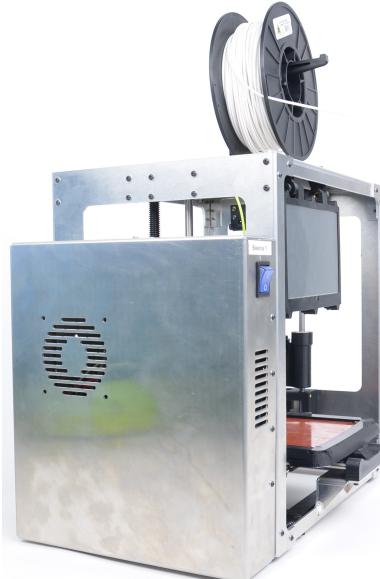


Figure 1.2: Begonia Left Photo

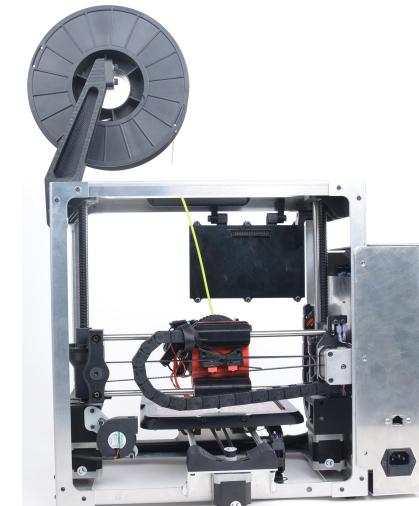


Figure 1.3: Begonia Back Photo



Figure 1.4: Begonia Right Photo

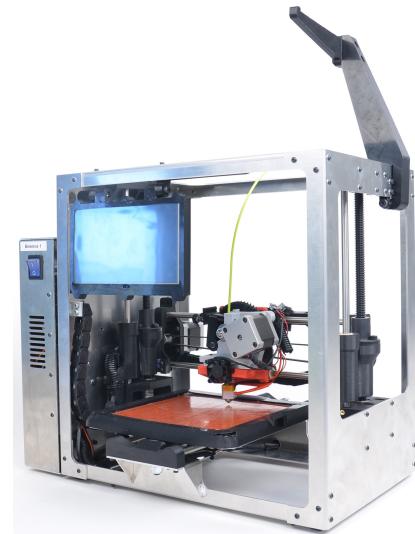


Figure 1.5: Begonia Spool Arm Up Photo



Figure 1.6: Begonia Spool Arm Down Photo



Figure 1.7: Begonia Green Color Scheme Photo



Figure 1.8: Begonia Black Green Color Scheme Photo

Specs

Specs
Specifications

2.1 Specifications**Printing**

- Print Surface: Heated Borosilicate glass bed covered with PEI film
- Print Area: 155mm x 155mm x 155mm (6.1in x 6.1in x 6.1in)
- Print Volume: 3.726cm³ (227.4 in³) of usable space
- Top Print Speed: 275mm/sec (10.8in/sec)
- Print Tolerance: 0.1mm (0.0039in) in X and Y axes. Z axis is dependent on layer thickness
- Layer Thickness: 0.075mm to 0.50mm (0.003in - 0.020in)
- Supported Materials: ABS, PLA, HIPS, PVA, wood filled filaments, Polyester (Tritan), PETT, filled PLA, Bronze and copper filled filaments, Polycarbonate, Nylon, PETG, Conductive PLA and ABS, UV luminescent filaments, PCTPE, PC-ABS, and more every day.
- Usable Filament Sizes: standard 3mm (0.1in)

Physical Dimensions

- Overall Dimensions: 435mm x 340mm x 385mm (17.1in x 13.4in x 15.2in)
- Weight: 8.55kg (18.85lbs)

Electrical

- Power Requirements: 100 - 240 VAC
- Power Supply: 24V 150W
- US, UK, and EU electrical plugs available

2.1. SPECIFICATIONS**Temperature**

- Temperature: Maximum operating temperature (Extruder), 300C (572F)
- Temperature: Maximum operating temperature (Heated Bed), 120C (248F)

The schedule is updated weekly. It is in Libre Office spreadsheet format. The latest version is available here:
http://devel.lulzbot.com/mini/program_management/

Mechanical

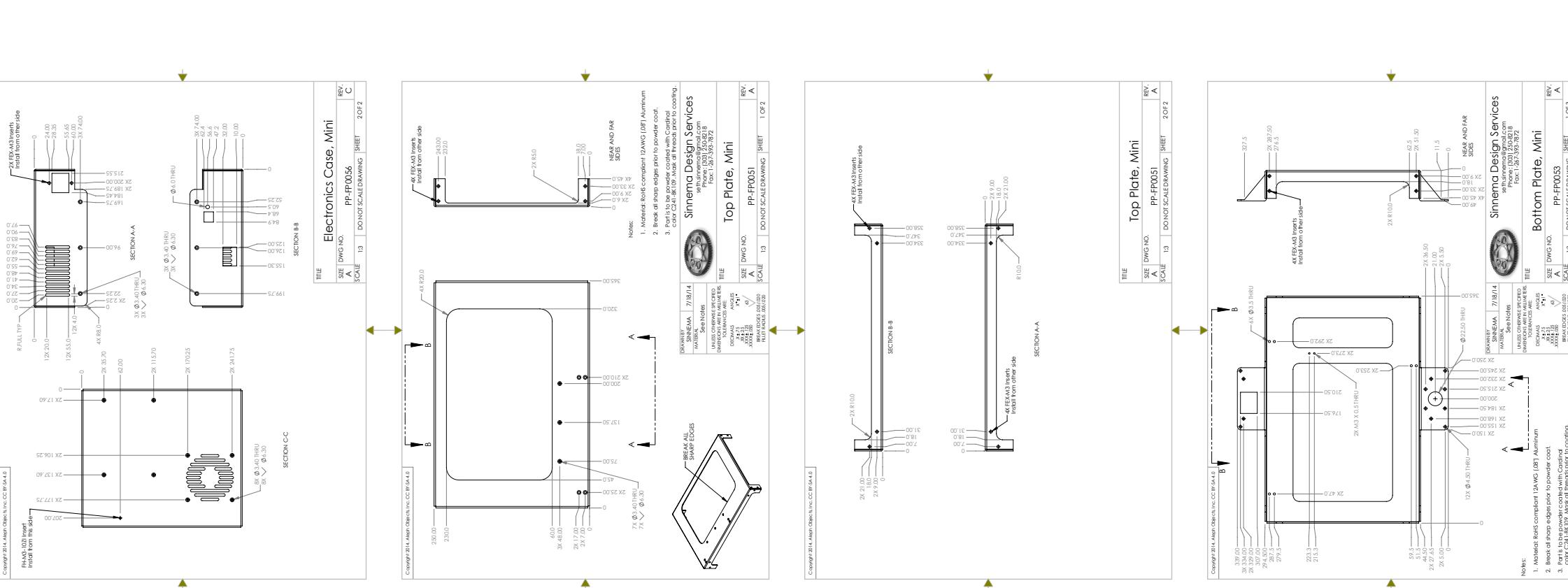
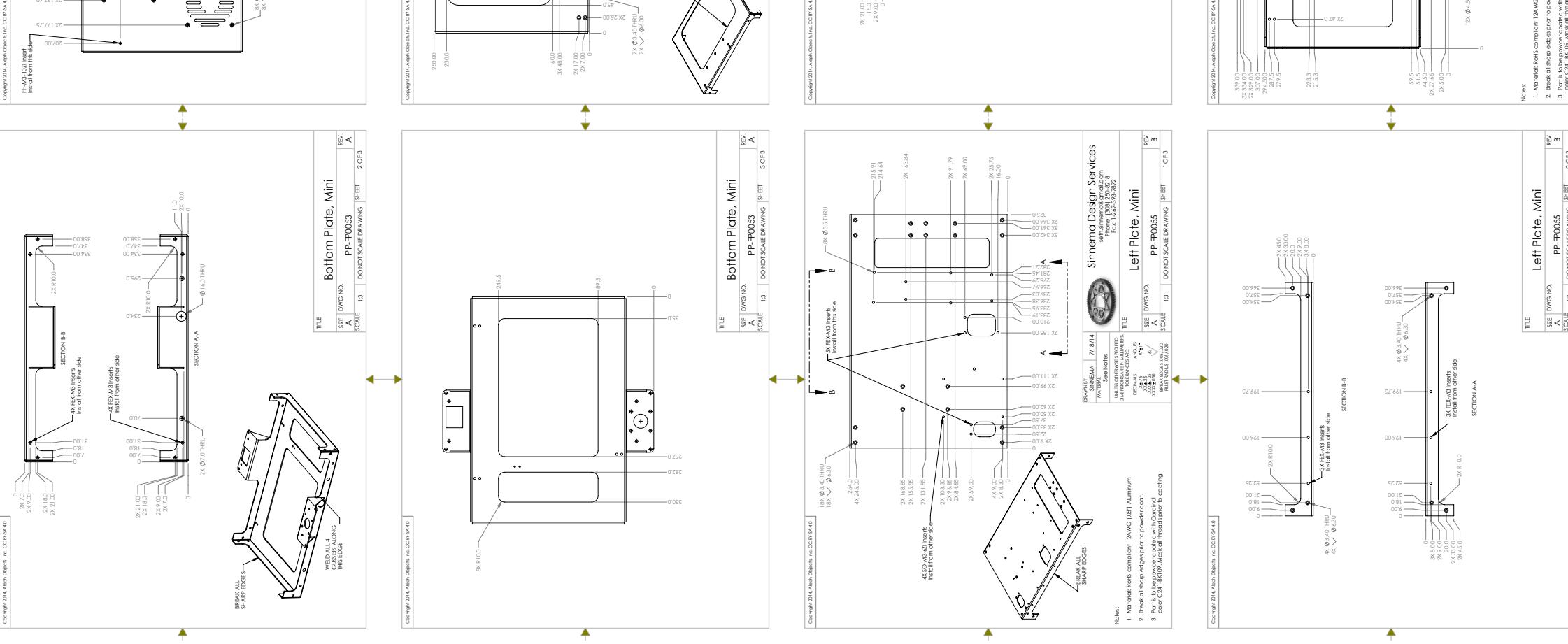
Cartesian Bot in X, Y, Z

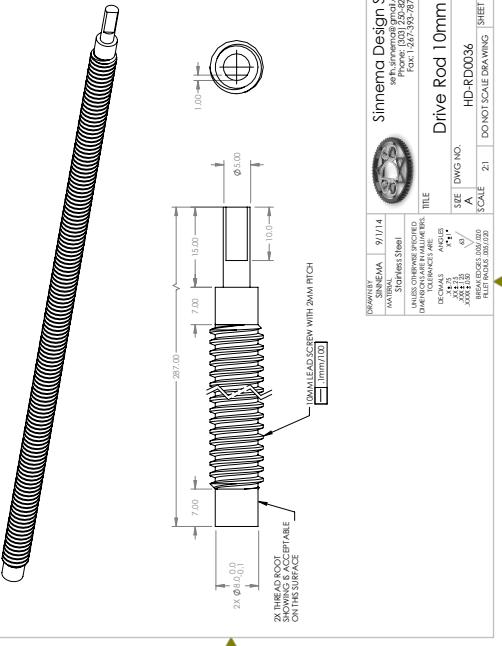
Mechanical hardware

<http://devel.lulzbot.com/mini/>

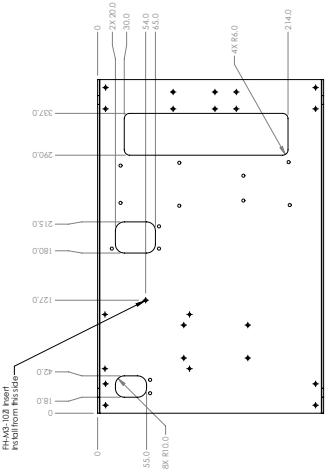
2 Bill of Materials

3 Drawings

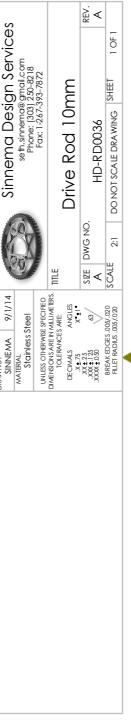




1



FH-M3-102 Insert
Fits tall from inside



title Left Plate, Mini
SIZE DWG NO.
REV.

3.4 3D Printed Parts

3.5 Bed

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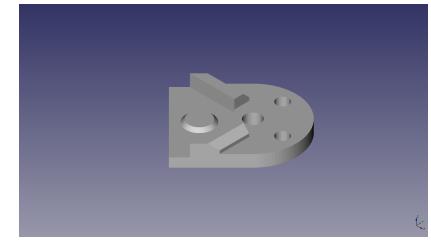
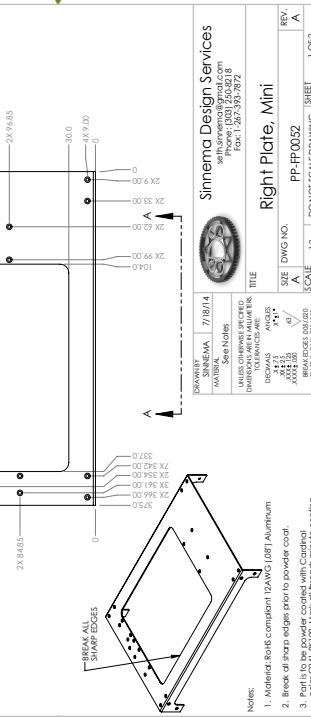
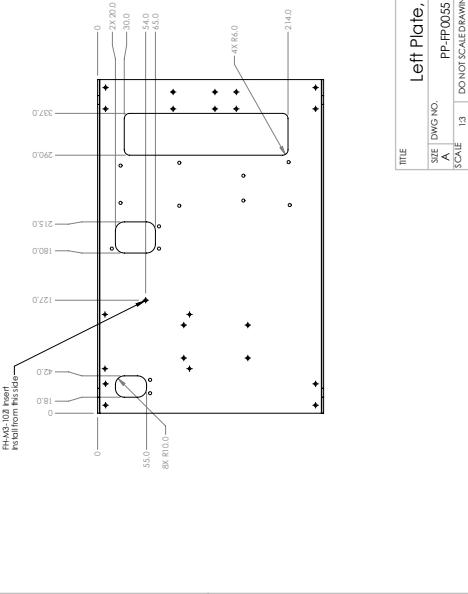
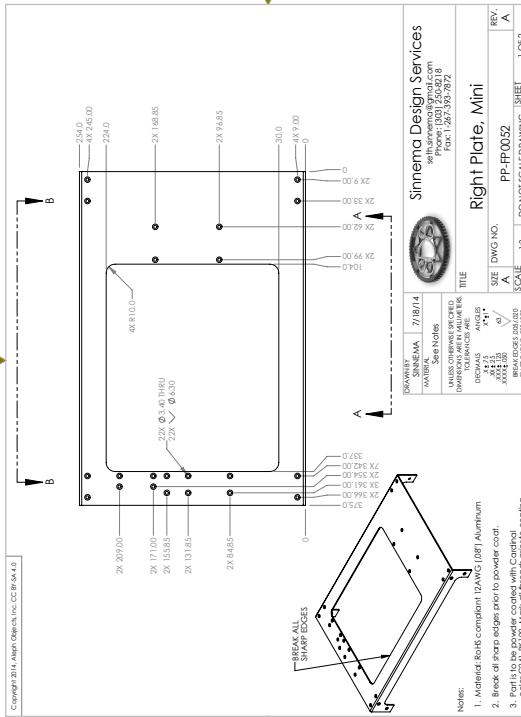


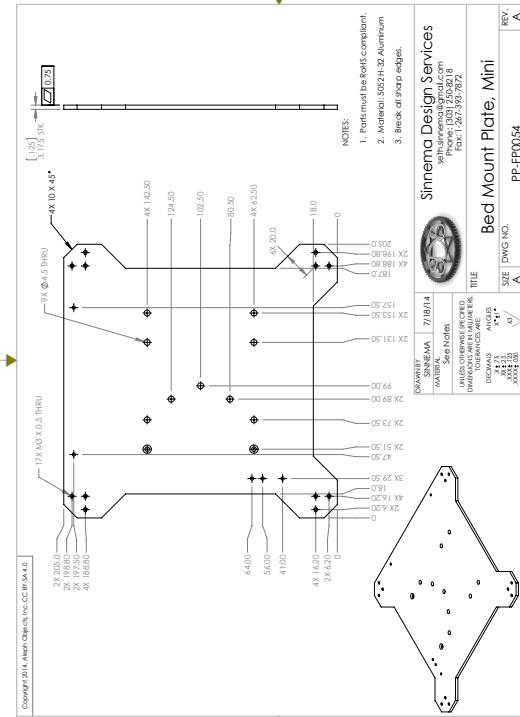
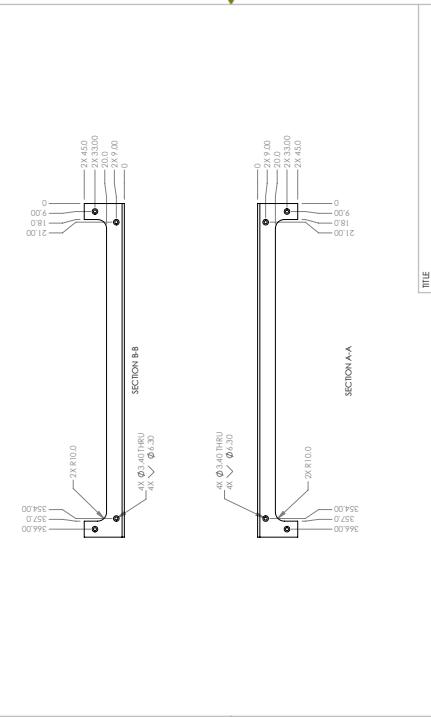
Figure 3.9: 3D Printed Bed Corner Render



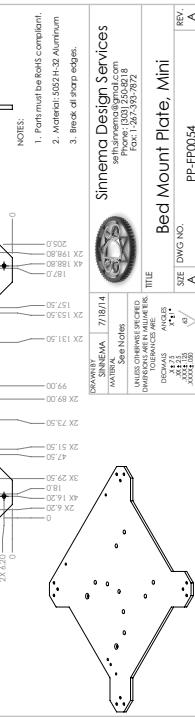
FH-M3-102 Insert
Fits tall from inside



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Technical drawing showing two views of a flange assembly. The top view shows a rectangular flange with a central hole and two side holes. Dimensions shown are 28-620 and 0. The bottom view shows a similar flange with a central hole and two side holes. Dimensions shown are 28-620 and 0. A note indicates that parts must be bolted compliant.

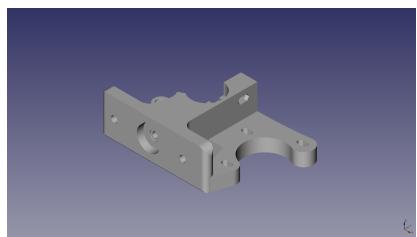


Figure 3.10: 3D Printed Extruder Body Render

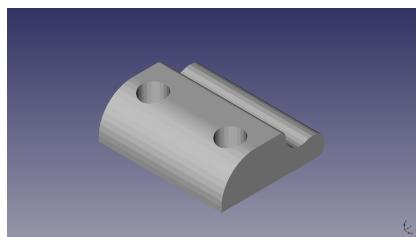


Figure 3.11: 3D Printed Extruder Latch Render

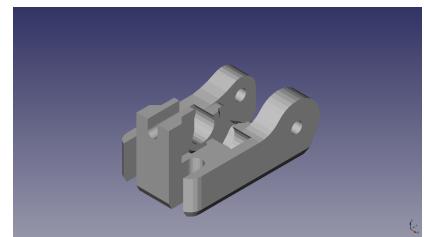


Figure 3.12: 3D Printed Idler Render

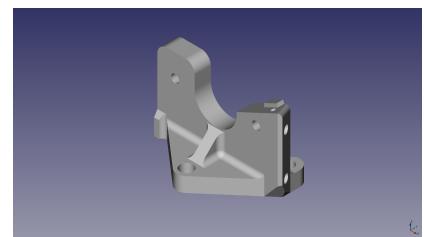


Figure 3.13: 3D Printed Extruder Mount Render

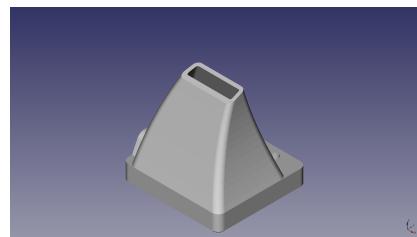


Figure 3.14: 3D Printed Fan Mount Render



Figure 3.15: 3D Printed Large Gear Render

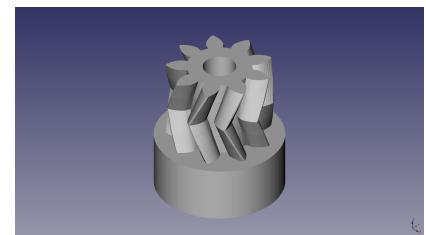


Figure 3.16: 3D Printed Small Gear Render

3.7 Spool



Figure 3.17: 3D Printed Spool Arm Render

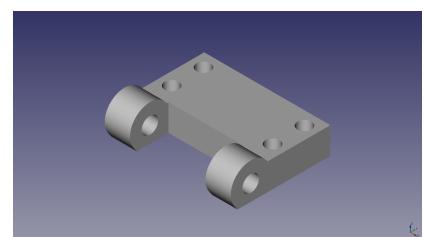


Figure 3.18: 3D Printed Spool Hinge Render

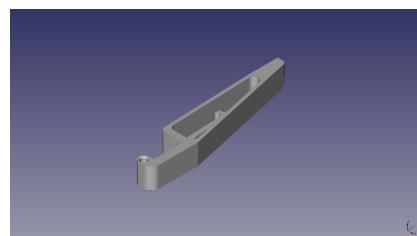


Figure 3.19: 3D Printed Spool Mount Render

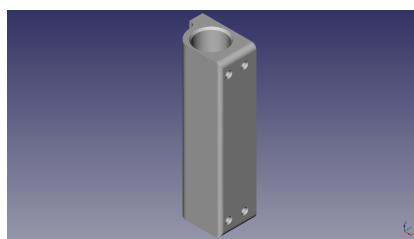


Figure 3.20: 3D Printed Double Bearing Holder Render

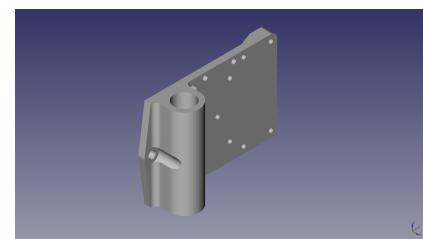


Figure 3.22: 3D Printed X Carriage Render

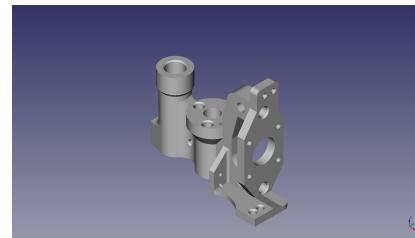


Figure 3.24: 3D Printed X End Motor Render

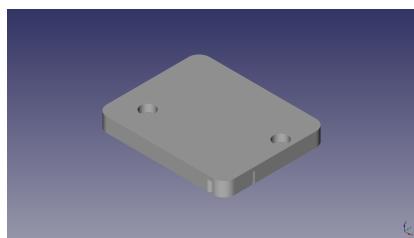


Figure 3.21: 3D Printed X Carriage Cover Render

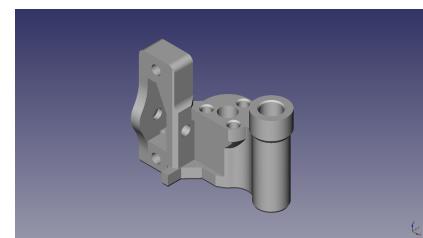


Figure 3.23: 3D Printed X End Idler Render

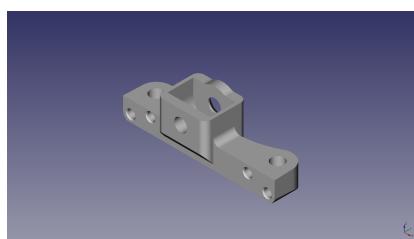


Figure 3.25: 3D Printed Y End Idler Render



Figure 3.27: 3D Printed Lower Relief Render

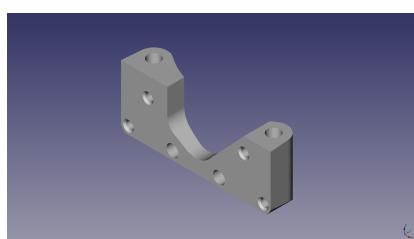


Figure 3.26: 3D Printed Y End Rod Mount Render

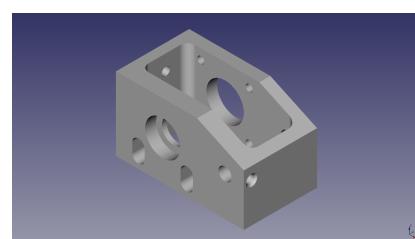


Figure 3.28: 3D Printed Lower Z Left Render

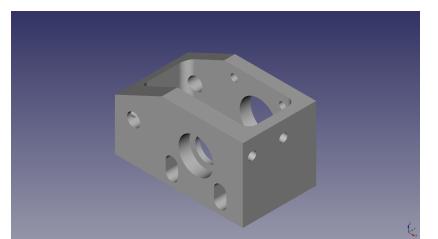


Figure 3.29: 3D Printed Lower Z Right Render

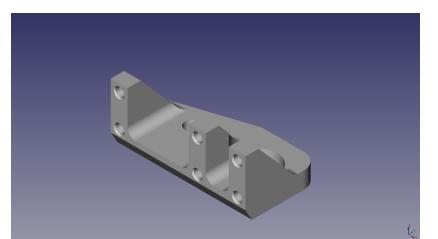


Figure 3.30: 3D Printed Upper Z Left Render

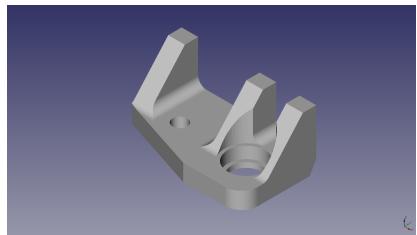


Figure 3.31: 3D Printed Upper Z Right Render

3.11 Misc

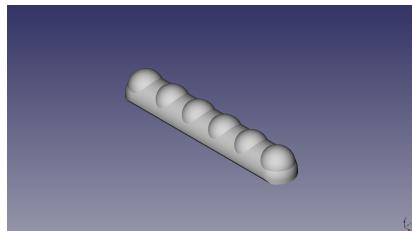


Figure 3.32: 3D Printed Handle Bar Render

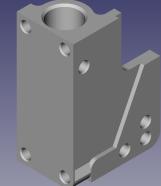


Figure 3.34: 3D Printed Upper Bearing Holder Render



Figure 3.33: 3D Printed Relief Mount Render

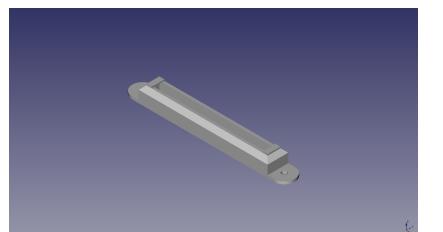


Figure 3.35: 3D Printed Wiper Mount Render

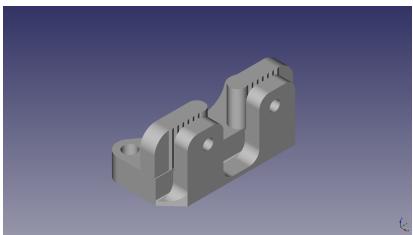


Figure 3.36: 3D Printed Belt Mount Render

Electrical

Power Supply, wiring

4.1 Electrical Layout

4.2 Wire Harness List

Carmella Wire List - V1.0	
1	WIRE 1
2	WIRE 2
3	WIRE 3
4	WIRE 4
5	WIRE 5
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300	WIRE 300
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406	WIRE 406
407	

5.1 Intro

The printer controller will be the RAMBo-Mini.

3D Printer Controller

Mini-RAMBo

Quality Assurance

6.1 Quality Assurance

QUALITY ASSURANCE RECORD						
Page 1 of 3						
Model: LulzBot Mini 1.0 3D Printer						
Date: Complicated Day						
Configuration:						
Bechtle: Multi-300Wts 1.0a						
Printer Name: C4						
Name: Name						
Comments: Comment about configuration settings.						
Stepover Motor	Stepover	Max Length	Microstep Mode	Digitstep		
X	10/15	15.5	16	175		
Y	10/15	15.5	16	175		
Z	16/20	15	16	175		
	80/80	N/A	N/A	155		
	160/160	N/A	N/A	155		

QUALITY ASSURANCE RECORD
Page 2 of 3

QUALITY ASSURANCE RECORD	
Date of Test:	Page 3 of 3
<p>Test and Verification Results:</p> <p>Very clear dust blowing Very slender blow in running Very control of the environment No noise or vibration during test cycle. Dust collector system is working effectively X and Y thermometers are making contact with both leveling weather Bellows is a working properly The blower can work over a range and speed.</p>	
 <p>UL-201TM APPROVED</p>	

7.1 Packing List

Pack it well.

Packing
If It Shakes It Breaks

Page 1 of 1

PACKING LIST



LulzBot Mini

Model: LulzBot Mini 1.0 3D Printer

Serial Number:

Printed On:

Compiled By:

Items to include:

Printer and Cables

- LulzBot Mini 1.0 3D Printer
- 1x SAVC Power Cord (7691) (if applicable)
- 6x SAVC Ethernet Power Cord Cable (7692) (if applicable)
- USB - Cable

Shipping:

- UPS International Shipping
- Other carrier or carrier
- UPS FOB
- Domestic pack
- Freight
- Hand
- Air
- Sea
- By replacement shipping
- Pads

Print:

- Rockcops™ printed by this LulzBot Mini 3D Printer

Documentation:

- Owner's Guide
- Quick Start Guide
- Record document
- Packing List document

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Contact**Phone, Email, Web, Location**

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 LulzBot Forum
<http://forum.lulzbot.com>

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8.3 Websites

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 LulzBot 3D Printers
<http://www.lulzbot.com>

Colophon

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 \LaTeX Memoir
