Fret Work in Progress

The first ‘bonus’ section of these instructions lets you make the current iteration of the chord making assembly of the GuitarBot. The majority of the parts used here are 3D printed or laser cut so it is vital that you have access to both of these tools. All of the materials on this page must also be purchased in addition to the standard Bill of Materials.

Bill of Materials:

Name	Number
Solenoid	30
¼ - 20 X 6” Hex Bolts	6
¼ - 20 Hex Nuts	12
¼ - 20 Spring Washers	6
¼ -20 Washers	30
¼ -20 X 1” Aluminum Spacers	6
Acrylic Sheet (0.1” thick)	3
Acrylic Sheet (0.2” thick)	1
Solenoid Caps print	30
M6 12mm BHSCS	4
M6 Split Washer	4
10 Series M6 Nut	4
Fret Support Top 3D print	1
Fret Support Bottom 3D print	1

Tools
¼” Wrenches
Pliers
Laser Cutter
Hacksaw

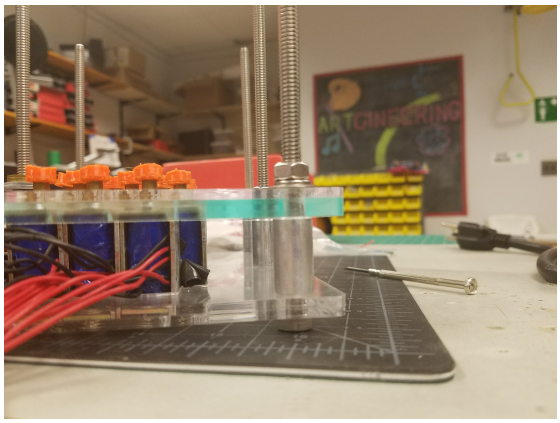
Step 1:

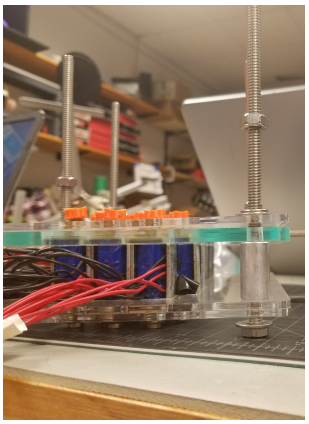
Need:

- 1x Acrylic Sheet (0.1” thick)
- 1x Acrylic Sheet (0.2” thick)

With a laser cutter, cut out the file: laser cut ‘russ 1.9.8 squares.dwg’ twice. One with the 0.2” thick sheet of acrylic and the other with the 0.1” thick sheet. Next, with only the 0.1” thick sheet, cut out the file: top.jpg and the file: ‘Laser Cut Slotted Piece.dwg’ once each.

Step 2:



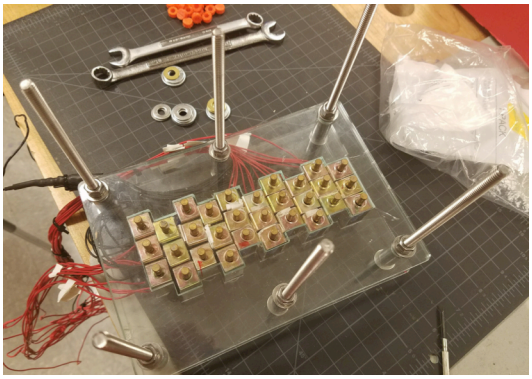


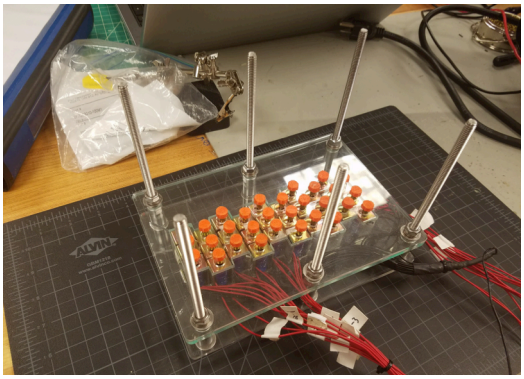
Need:

- 30x Solenoids
- 4x Acrylic Pieces cut in last step
- 6x ¼ - 20 X 6” Hex Bolts
- 6x ¼ - 20 Hex Nuts
- 6x ¼ - 20 Spring Washers
- 6x ¼ -20 Washers
- 6x ¼ -20 X 1” Aluminum Spacers

There should be six ¼ -20 holes along the perimeter of the cut acrylic plates. Use a hacksaw to cut the small holes off the sides of each solenoid. Sandwich the 30 solenoids between the acrylic plates and hold them in place with the ¼ -20 X 6” bolts. They should fit in to the plates with the square holes like ‘puzzle pieces’. Note: follow the images above for proper fastening. The 1” aluminum spacers should fit between the sheets of acrylic and the six spring washers should fit between the ¼-20 nuts and ¼ -20 washers. There should be ¼ -20 washers between the heads of the bolts and the acrylic cuts as well as between the nuts and the acrylic. Finally, add a few ¼-20 washers to each bolt to give it space for the upcoming steps.

Step 3:





Need:

- 30x Printed Caps

After 3D printing the caps in SemiFlex™, apply them to the ends of the solenoids. These caps are designed to be flexible such that they mimic the dampening qualities of the human finger. Additionally, wire management for the solenoid connectors is not mandatory, however, it is highly recommended for good quality.

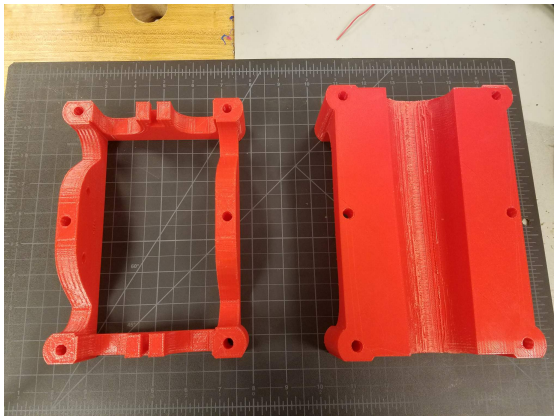
Step 4:

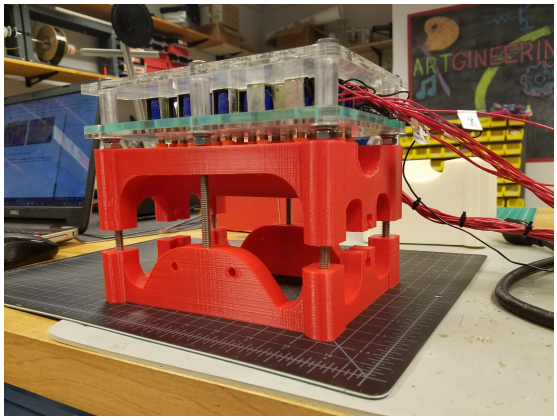
Need:

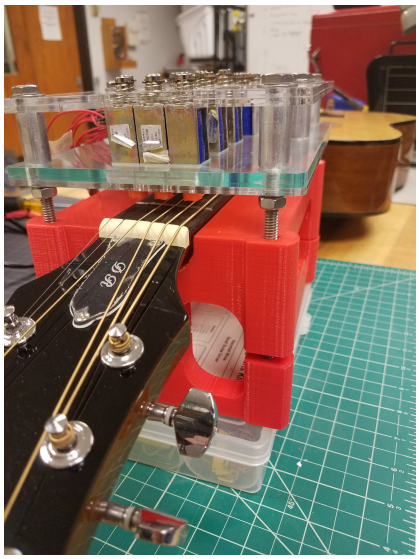
- Guitar
- GuitarBot

Slot the guitar into the GuitarBot and use the 4 Arms to lock the guitar into place.

Step 5:







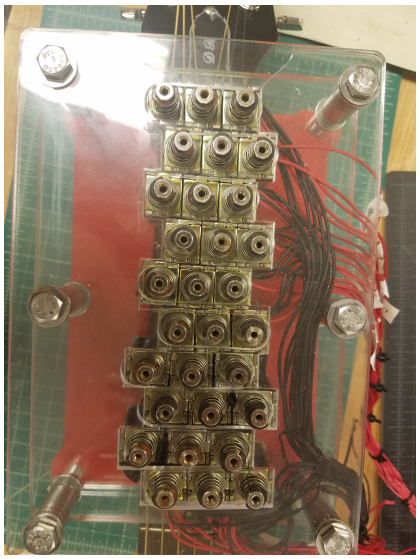
Need:

- 1x Fret Support Top 3D Print
- 1x Fret Support Bottom 3D Print
- 4x M6 12mm BHSCS
- 4x M6 Split Washer
- 4x 10 Series M6 Nut
- 6x ¼-20 Hex Nuts

Slot the Fret Support Bottom 3D print into the very top of the GuitarBot's Arms and bolt them in place using the M6 screws, washers, and nuts. Then slide the Fret Support Top 3D Print on top of the Bottom. Slot the ¼-20 bolts from the solenoids through the holes on the 3D prints. Secure to the frame with the ¼-20 Hex Nuts.

Step 6:

35	37	39	
	36	38	40
41	43	45	
	42	44	46
47	49	21	
	48	20	22
23	31	27	
	28	25	24
29	26	33	
	30	32	34



Wire the solenoids according to the diagram on the left. The positive line from each solenoid connects to the vertical screw terminals of the GuitarBot in these positions. Combine the grounds into one wire and attach it to the Screw Shield according to the wiring diagram.