



DIY MINI CNC DRAWING MACHINE



by Mr innovative

This is mini cnc drawing machine



Step 1: VIDEO

[//www.youtube.com/embed/txdDOE6iW2o](https://www.youtube.com/embed/txdDOE6iW2o)

Hello friends

I have made a mini size CNC plotter machine out of mini stepper motor mechanism

To controller this CNC machine we need a microcontroller board called arduino Nano and we need motor driver IC for each stepper motor that is L293D IC.

All the electronics components are solder on a costume made PCB.

I prepared a PCB layout and order it from JLCPcb.COM as soon as PCB are received it just need to solder header pins, PCB terminals & CNC is ready to load code to run.

[JLCPcb](http://JLCPcb.COM) is PCB manufacturing company they provide upto 10 prototype PCB in just 2\$.

If you need any PCB to order for you future electronics projects you can consider to visit JLCPcb.COM

Step 2: Wiring and Circuit Drawing

In the CNC controller PCB I have used 2 L293D motor driver IC,

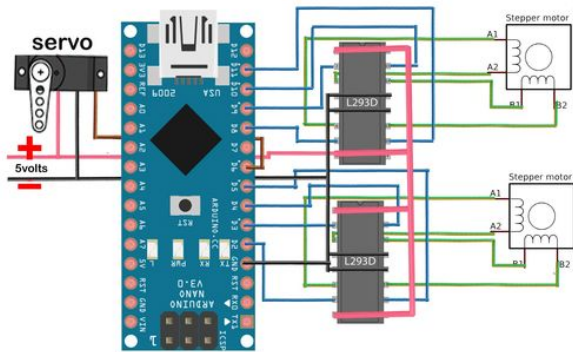
L293D Driver IC is H- bridge IC it can control max 2 DC motor in each direction or can control

a single bipolar stepper motor.

L293D IC logic voltage is 5 - 7V DC, Motor voltage is

5 - 35V DC, it can handle current upto 1.2 A .

If you want to order the same PCB which i have used so I have attached a gerber of PCB in this post also I have given a PCB editable file which you can open in Fritzing software and can modifies PCB as per you requirement



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Step 3: Material Required.

Following are the material which I have used, you may try some thing efferent and and share with us..

Custom made PCB from JLPCB.COM

100mm Stepper motor :-

https://www.banggood.in/DC-4-9V-Drive-Stepper-Motor-Screw-With-Nut-Slider-2-Phase-4-Wire-p-964613.html?rmmds=search&cur_warehouse=CN

Arduino nano :- <http://amzn.to/2zgmRwU>

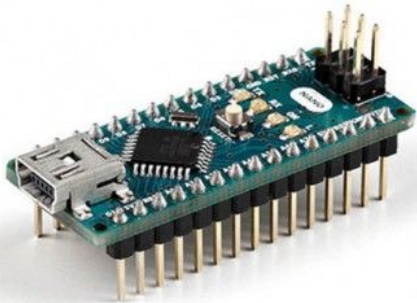
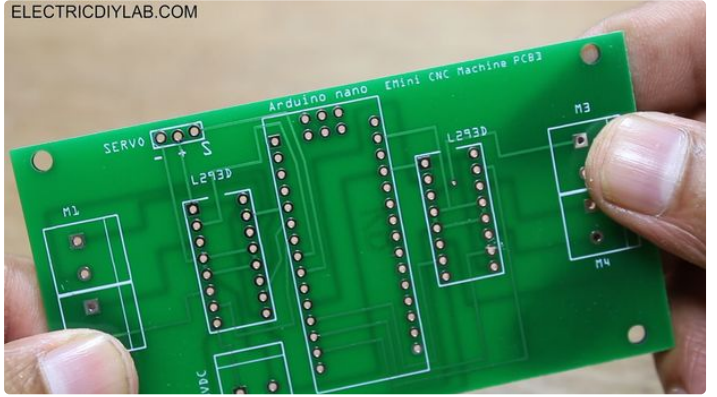
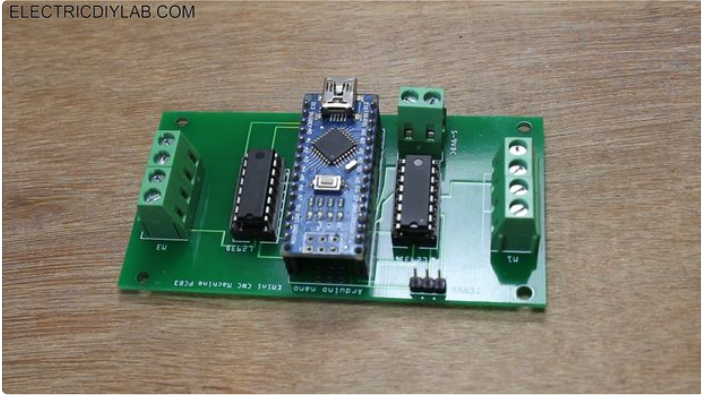
L293D IC :- <http://amzn.to/2BmWqaL>

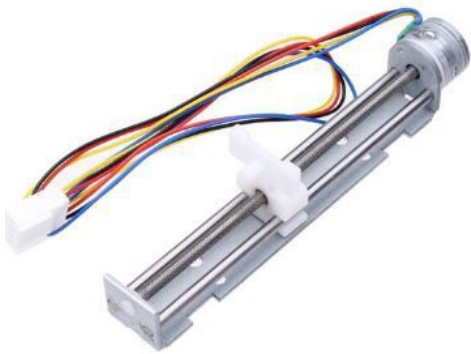
PCB Terminal :- <http://amzn.to/2BPuUUq>

Header pin :- <http://amzn.to/2BPuUUq>

Servo motor :- <http://amzn.to/2BPuUUq>

5V adapter :- <http://amzn.to/2BPuUUq>





Step 4: Source Code & Programming

It is good to know role of each component and software in CNC machine

1) ARDUINO Arduino is basically work as a brain of CNC Machine a CNC code uploded to arduino so that when Gcode stream to arduino Arduino commands motor shield to run stepper motors.

2) L293D Motor shield This is dedicated shield to control verities of motor with arduino here this shield control two stepper motor(x-axis & y-axis) and one servo motor, <https://cdn-learn.adafruit.com/downloads/pdf/adaf...> read this for detail technical knowledge.



3) Servo motor Basically this motor is used here just to UP/DOWN pen servo is connected with motor shield

4) Arduino IDE This is used to upload code to arduino

5) Processing IDE This is used to stram G-CODE to arduino

6) Inkscape This is used to make G-CODE file of any image

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Step 5: Preparing G-CODE

G-code is the format of file which your machine can understand and work accordingly

Suppose you have to draw some text with machine so you need its Gcode

so what you do Inkscape software provides you a facility to convert image or text into G-code.

how to convert file in G-code watch this [video](#)

But when you download Inkscape software there is not a G-CODE save as option

so you need to add a library Extension in inkscape for this download the following Makerboat g-code unicorn extension [https://github.com/martymcguire/inkscape-unicorn/...](https://github.com/martymcguire/inkscape-unicorn/) How to add this extension to Inkscape

- 2) Open the folder by double click
- 3) Copy all the sub folders & files
- 4) Right click to the inkscape icon from desktop .
- 5) Go to Properties
- 6) Go to open file location
- 7) Open "SHARE" folder
- 8) Open "EXTENSION" folder
- 9) Past here all that file
- 10) its done

1) Unzip the file



Step 6: Processing IDE

Our arduino is ready our machine is ready and our g-code is also ready to print

So we need something which can transmit g-code to Arduino,

so here we have Processing GCTRL program
Download GTRL Code from below link [https://www.dr
opbox.com/s/p4thx3c3bttm52x/gctrl-m...](https://www.dropbox.com/s/p4thx3c3bttm52x/gctrl-m...)

After downloading the GCTRL Code unzip the folder load the gctrl code to

processing and press play button a new window open from this window you can select your communication port, By pressing "G" a browser is open select your g-code file and upload it as soon as you upload the file Machine start drawing

```
gctrl
INSTRUCTIONS
p: select serial port
1: set speed to 0.001 inches (1 mil) per jog
2: set speed to 0.010 inches (10 mil) per jog
3: set speed to 0.100 inches (100 mil) per jog
arrow keys: jog in x-y plane
page up & page down: jog in z axis
h: go home
0: zero machine (set home to the current location)
g: stream a g-code file
x: stop streaming g-code (this is NOT immediate)

current serial port: null
current jog speed: 0.0010 inches per step
```



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