

Easy To Build Stepper Controller from Recycled Materials

by [murray484](#) on February 27, 2009

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intro: Easy To Build Stepper Controller from Recycled Materials

I am 13 I have always wanted to build a cnc machine but because inexpensive parts are hard to find in Canada I have had trouble trying to build a decent cnc controller. The purpose of this Instructable is to show that anyone can build a cnc controller using an old scanner. The scanner I used was an old OpticPro scanner. I had previously extracted the stepper motor and experimented with it but not considered it for a cnc controller. All of the controllers on the Internet had a large number of expensive transistors or were ridiculously complex. I finally stumbled across [this](#) controller and realized I could build it. By reusing the parts from the old scanner and making the case from recycled cardboard, I am cutting back on my impact on the planet. Also, because this controller is so simple, it only needs one power supply, so, it only needs 1 12 volt (for both the logic and the motors), instead of 1 5volt (for the logic) and 1 12 volt (for the motors). This saves energy, especially when you run it for a long period of time.

If you don't already know what a cnc machine is, it is a machine that uses special motors called stepper motors to move an object a precise distance. The difference between a stepper motor and a regular DC motor, is that stepper motors "Step", not spin. if you don't understand, refer to [this](#) article. There are two types of stepper motors. There is Bipolar, and Unipolar. Bipolar motors have 4 wires. Unipolar motors can have 5, 6 and 8 wires. The difference between these two types of motors is that unipolar motors have 4 coils inside that, when energized in a certain order, allow it to step forward and backwards. This makes them easy to control and is why we are going to use them in this instructable. Bipolar motors only have two coils that can be energized in forward, or reverse. To drive a bipolar motor you need two H-bridges. Because of this, bipolar motors motor controllers are much more complex.



Image Notes

1. The Controller
2. 12 volt input
3. To Computer

Image Notes

1. The Controller
2. The Control Computer
3. The mechanics

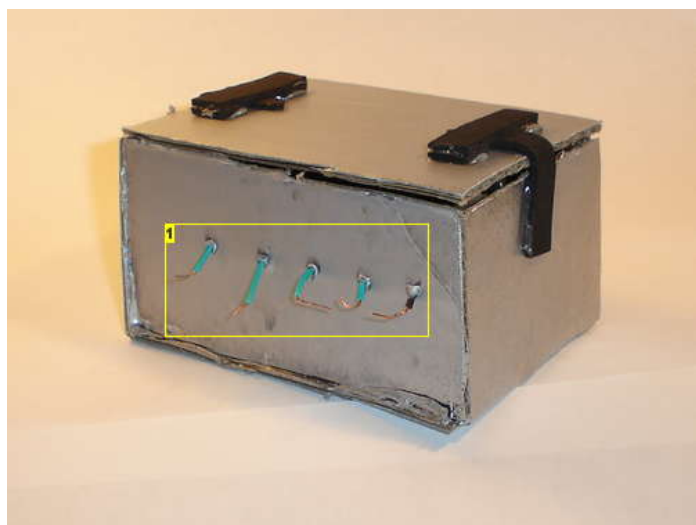


Image Notes

1. Motor Connections

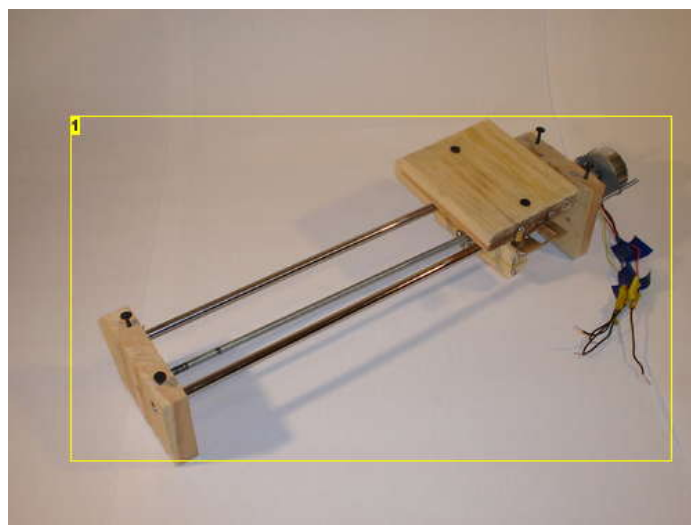


Image Notes

1. Test Axis



Image Notes

1. The Computer

step 1: Required Parts

The parts that are required for this project are:

In the scanner:

- 1 stepper motor
- 1 uln2003 chip
- 2 steel rods

For the enclosure:

- 1 cardboard box

The tools:

- Hot glue gun and glue
- Wire cutters/strippers
- Scissors
- Soldering tools
- Paint

For the controller

- 1 DB25 port (recycled from previous project)
- some wire
- 1 dc barrel jack (recycled from old RC car)

For the test rig

- 1 threaded rod
- 1 nut to match your threaded rod
- various washers and screws
- scrap wood (recycled from previous building projects)

For the control computer:

- 1 old computer (I used an old laptop)
- 1 copy of TurboCNC (get it [here](#))

step 2: Get Parts from Old Scanner

The first step to building your cnc controller is to extract your motor and control board. I did not take any pictures of this step because every scanner is different, but it is usually as simple as removing the glass and taking out a few screws. The two parts you are looking for are the stepper motor and the control board, but also keep the nice metal rods so that you can use them to test you motor.

step 3: Remove Chip from Control Board

The next step is to locate the uln2003 chip on your stepper driver. If your board does not have one, you can order one online for about 50 cents. If your board has a uln2003, you must desolder the chip from the board. This step can be a bit tricky, but is not that hard. First, try to remove as much solder as you can using your desoldering pump. Once you have removed the solder, use gentle, prying force with the tip of a screwdriver. Carefully touch the tip of your iron to each pin, still applying force with your screwdriver.



Image Notes

1. The Chip

step 4: Soldering

Now you need to solder the chip into your blank proto-board (I got mine at The Source).

Solder each pin to the board. My board had two power rails running up the center of the board, so I soldered the positive pin on the uln2003 (see schematic from [here](#) and pictured below) to the one of the rails and the negative pin to the other rail. Then, you must solder pin 2 on your parallel port connector to pin 1 on the uln2003. Solder pin 3 on the parallel port to pin 2 on the uln2003, pin 4 on the parallel port to pin 3 on the uln2003 and pin 5 on the parallel port to pin 4 on the uln2003. Now solder pin 25 on the parallel port to the negative rail on your circuit board. Now, solder the motor to the driver. Hooking up the motor to the board requires some trial and error. I just soldered wires so that I could use alligator clips. You could also use screw terminals or something similar. Simply solder a wire to pin 16, 15, 14 and 13 on the uln2003. Then solder a wire (preferably black) to the positive rail. Your driver is almost done. Finally, solder your barrel jack (I recycled mine from an old RC car) to the power rails on your circuit board. To prevent my wires from breaking off, I put hot glue over them.

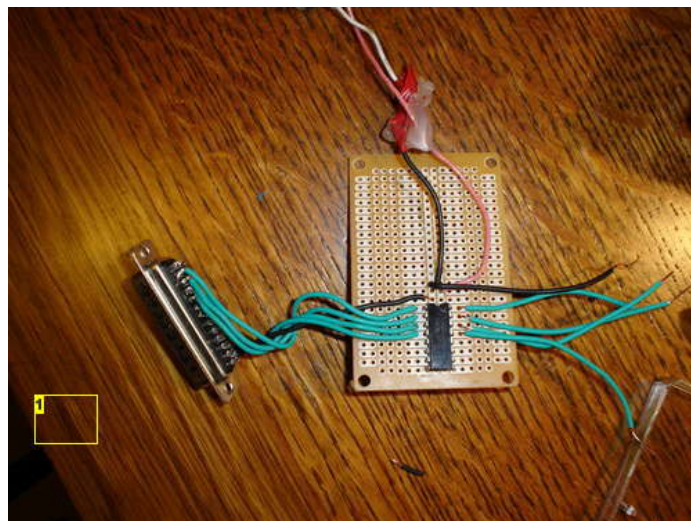
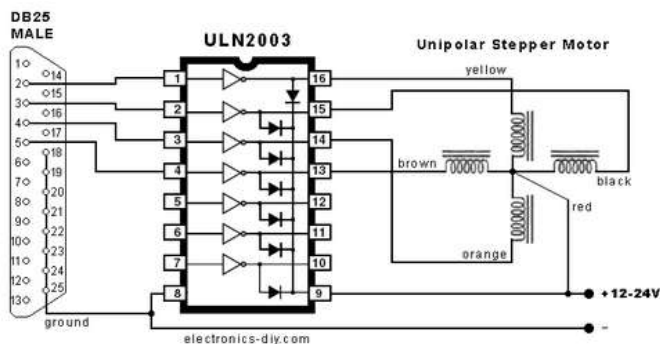


Image Notes

1. Finished Product

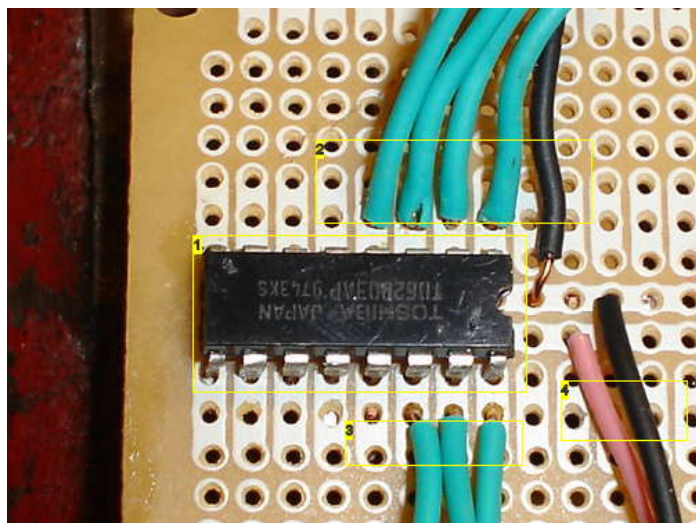


Image Notes

1. The ULN2003
2. Wires to Parallel Port
3. 3 of the wires to motor
4. Wire to DC Barrel Jack

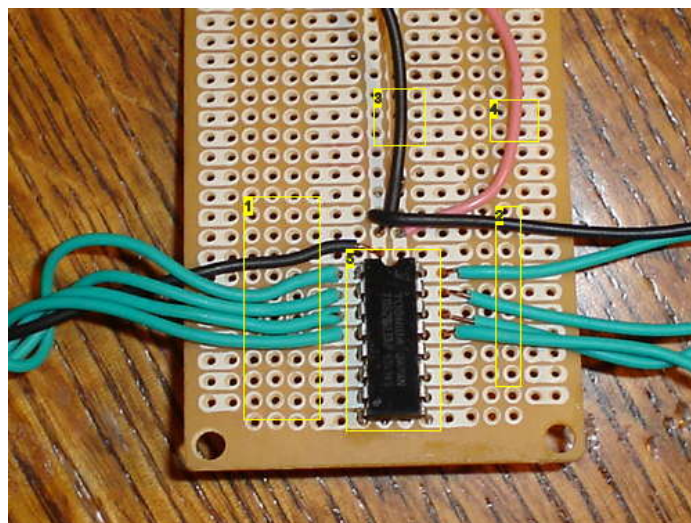


Image Notes

1. Parallel Port Wires
2. Wires to Motor
3. -12 Volts
4. +12 volts
5. The Chip

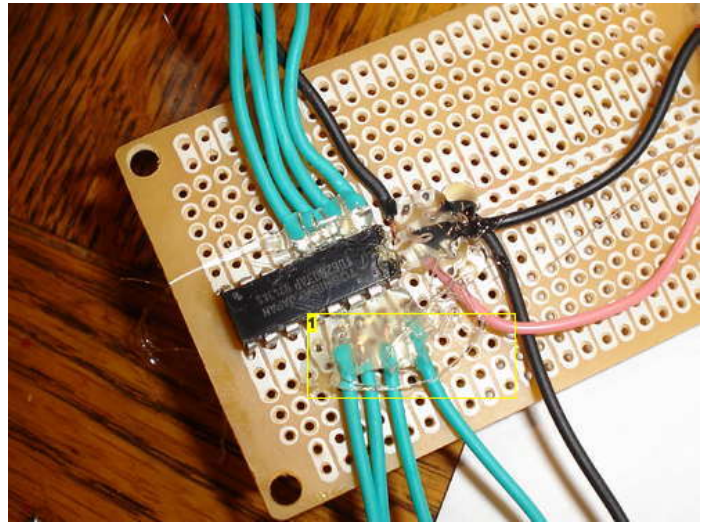


Image Notes

1. Lots of Glue

Image Notes

1. Parallel Port
2. Finished Board

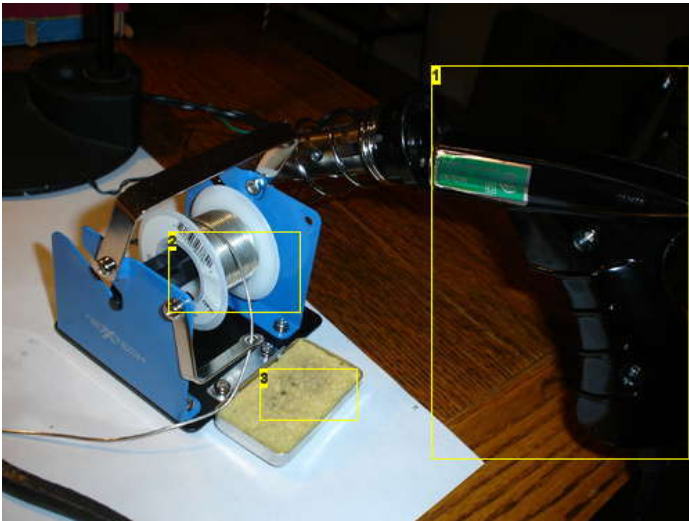


Image Notes

1. Soldering Gun
2. Solder
3. Sponge

step 5: Install Control Software

Now for the software. The only software that will work with this driver that I know of is Turbo CNC. Download it from <http://www.dakeng.com/turbo.html> . Un-zip it and burn it to a cd. Now, on the computer that you are going to use as your controller, go to your c: // drive and make a folder called "tcnc". Next, drag the files from the CD to the folder you just made. Exit all windows. You have now installed Turbo CNC.



Image Notes
1. TurboCNC on a CD

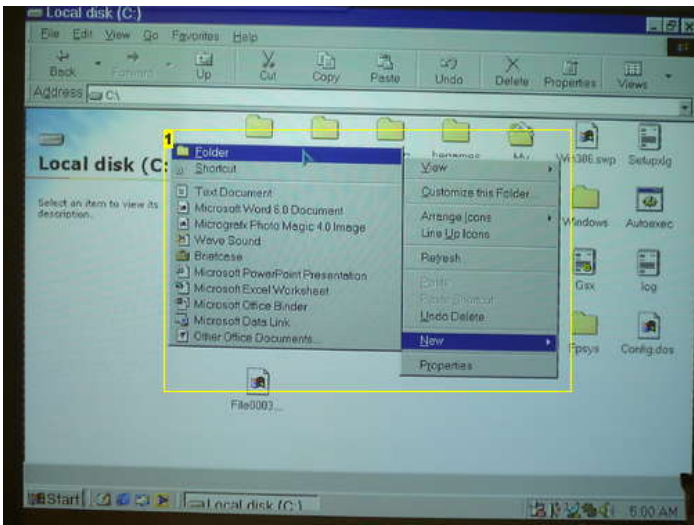


Image Notes
1. Make a new folder

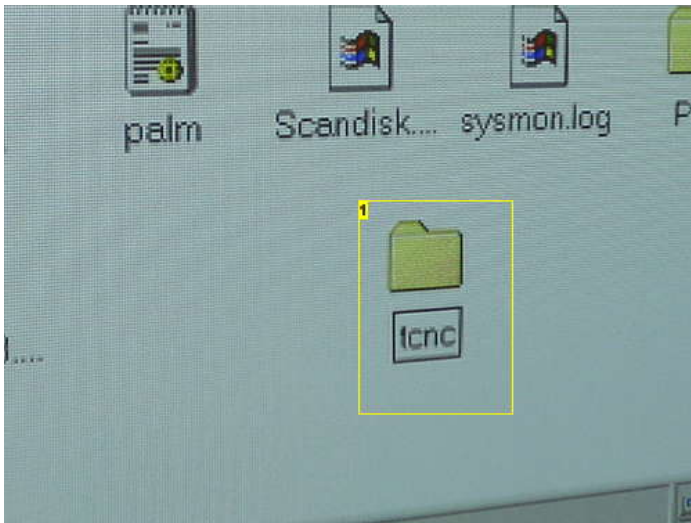


Image Notes
1. Name your folder "tcnc"

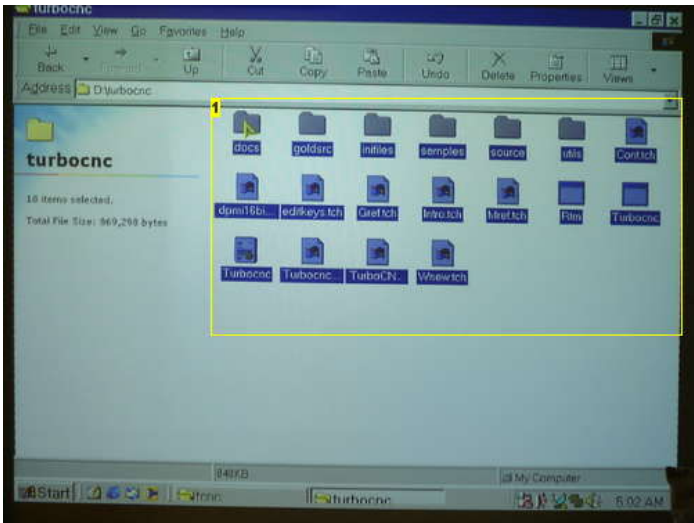


Image Notes
1. Select all of the files

Image Notes

1. Copy them to your new folder

step 6: Configure Control Software

Click start and shut-down. Then check the box that says "Restart in MS-DOS mode". You will get a command prompt. At the Prompt, type "C:\tcnc\tURBOCNC". Then you will get a screen like the one in image 3. Press any key. Now you are in the main program menu. Press F1, and then use the arrow keys to select the "Configure" menu. Use the arrow keys to select "number of axes". Press Enter. Enter the number of axes you will be using. I only made one driver, so I selected "1". Press enter to continue. Now press F1 again and navigate to the "Configure" menu. Select "Configure axes", then press enter twice.

You will see a screen that looks a little confusing. Do not worry, it is not that bad. Press tab until you get the box that says "Drive Type". Press the down arrow to select "Phase". Press tab again to select the Scale box. If your computer has a mouse in dos (mine does not), click the calc button. If yours is like mine, you can simply run the program off a computer running Windows XP or Vista by double clicking on the TURBOCNC file. Then, follow the above steps.

To use the calculator, you must find the number of steps per revolution that your motor takes. Google your motor's part number and look for how many degrees per step it takes. Then, divide 360 by the number of degrees per step to find your steps per revolution. For example, my motor turns 7.5 degrees per turn, so I divided 360 by 7.5 to get 48. Punch that number into your scale calculator. Leave the rest of the settings the same. Press ok, and then copy the number in the scale box to the scale box on the other computer. Next, change the value in the acceleration box to 20, as the default 2000 is way too fast for your system. Change the value of the start velocity box to 20, and the value of the max velocity box to 175. Change the value of the fast jog box to 175. Press tab until you get to the "Last Phase" option. Change its value to 4. Press tab until you get to the first row of x's. Copy the following into the first four boxes:

```
1000xxxxxxx  
0100xxxxxxx  
0010xxxxxxx  
0001xxxxxxx
```

Leave the rest of the boxes as they are. Select OK. You have now set up the software.

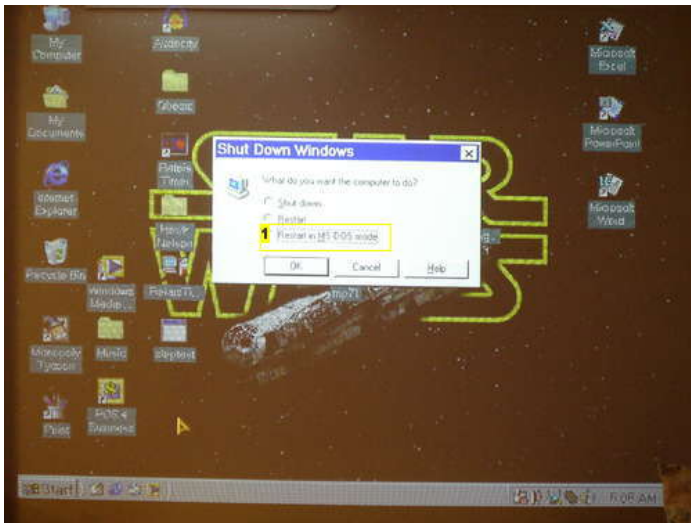


Image Notes

1. Select "Restart in MS-DOS mode"

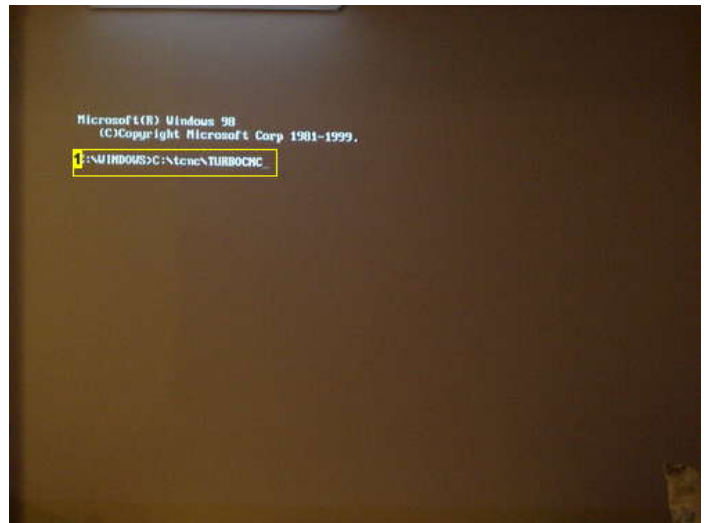


Image Notes

1. Copy this exactly

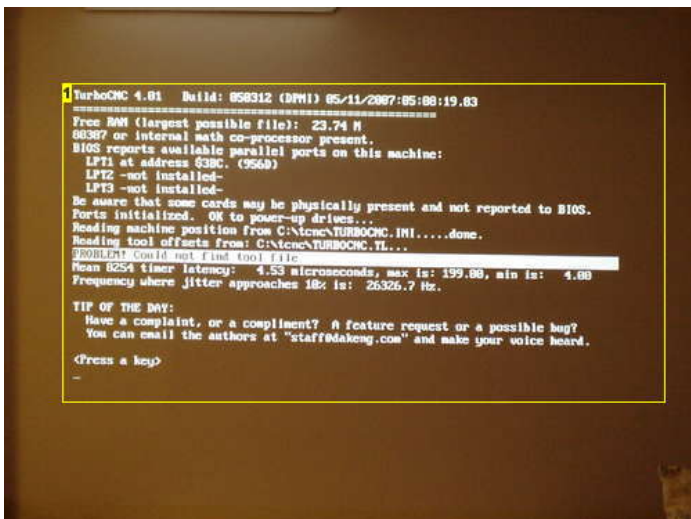


Image Notes

1. Press any key to get past this screen

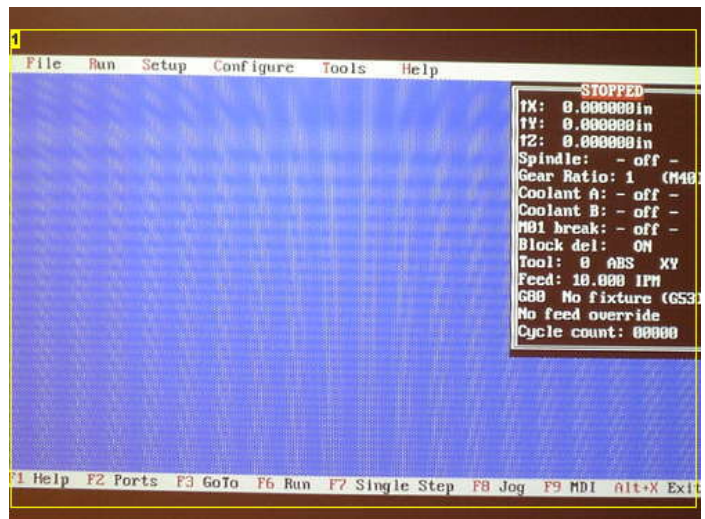


Image Notes

1. Initial start screen

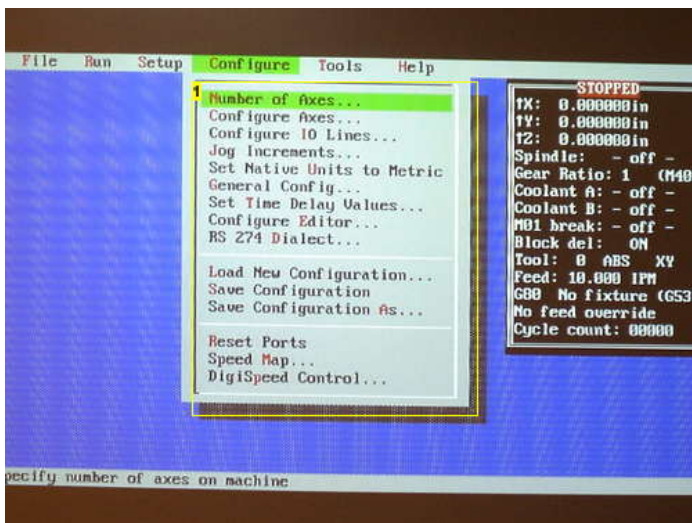


Image Notes

1. The configuration menu

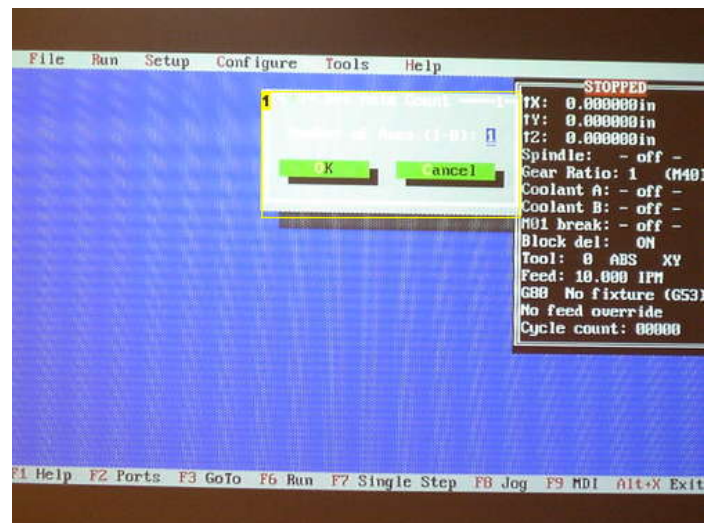


Image Notes

1. Set your number of axes here

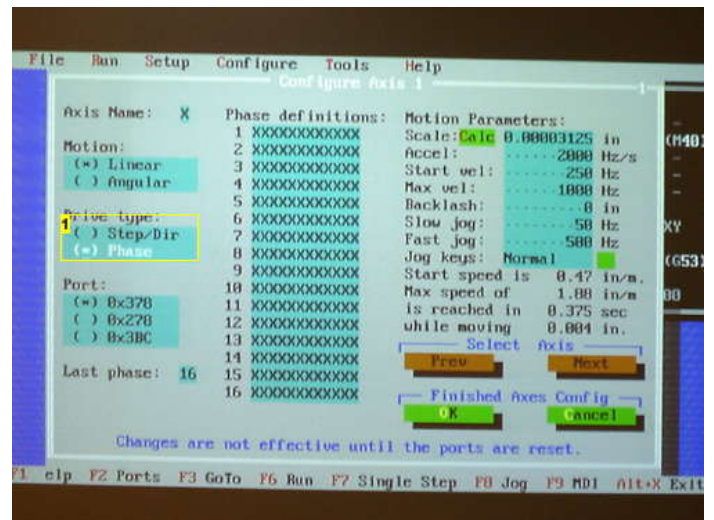


Image Notes

1. Select "Phase"

Image Notes

1. The axis configuration menu

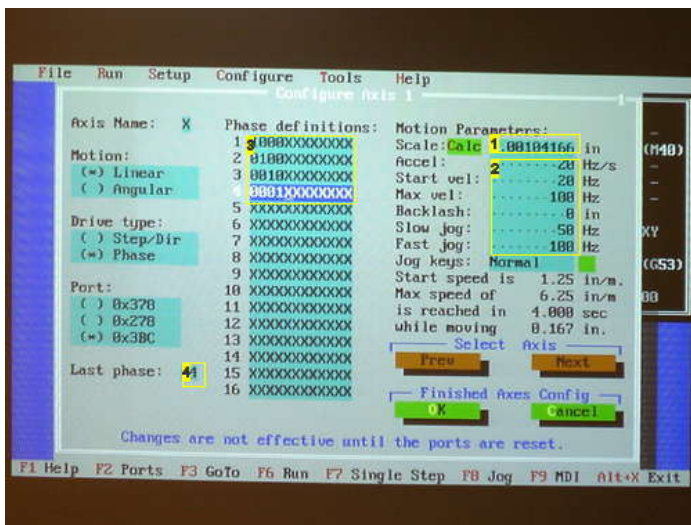


Image Notes

1. Type your scale here
2. Set these values as shown
3. Type your phases here
4. Set your last phase to 4

step 7: Build a test axis

The next step is to build a simple axis to use as a test system. Cut 3 pieces of wood and clamp them together. Draw a straight line on the wood to keep your holes straight. Drill two holes on the line. Finally, drill 1 hole centered below the line. Now you can un clamp your wood.

Place the two rods through the holes on the line. Screw a small screw into your rods to keep it in place. Slide your second piece of wood onto your rods. Mount your motor to the final piece of wood. It does not matter how you do this, be creative. I used two pieces of 1/8 threaded rod to hold mine in place. Now slide your wood with the motor attached to it on the other end of your rods. Screw the rods onto the wood. Slide your threaded rod through the third hole on your first piece. Screw your nut onto the rod. Slide the rod up to the second piece of wood. Turn the rod until it slides through the holes and up to the motor's shaft. Using aquarium air hose and zipties, connect the motor shaft to the threaded rod. To attach the nut to the 2nd piece of wood, I used various screws and nuts to hold my nut in place, but anything should work. Finally, cut a piece of wood the size that you want your stage to be. Screw it onto the 2nd piece of wood. Make sure that your stage is level. Mine was not, so I used washers as spacers. You have now built an axis for your motor.

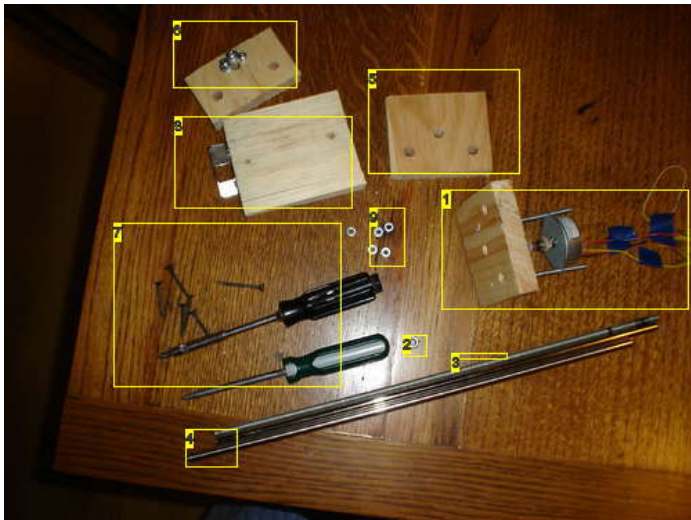


Image Notes

1. Motor attached to last piece of wood
2. 1/4 inch nut
3. 1/4 inch threaded rod
4. Rods from scanner
5. 1st piece of wood
6. 3rd piece of wood
7. Screws and screwdrivers
8. Stage
9. Washers to use as spacers

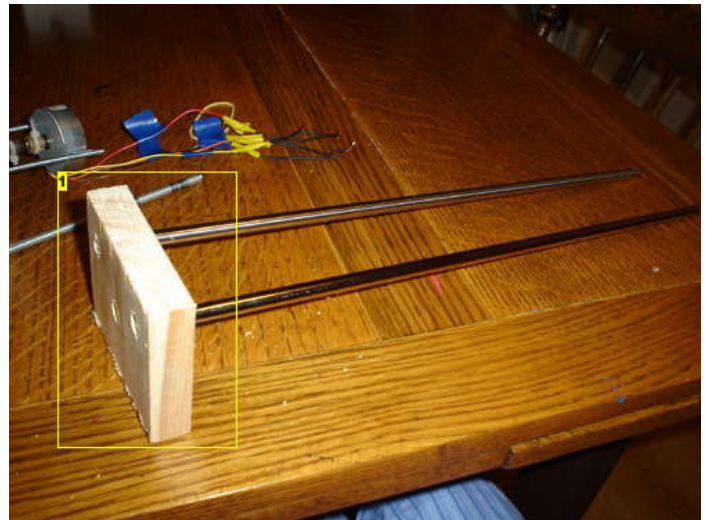


Image Notes

1. Slide the wood onto the rods

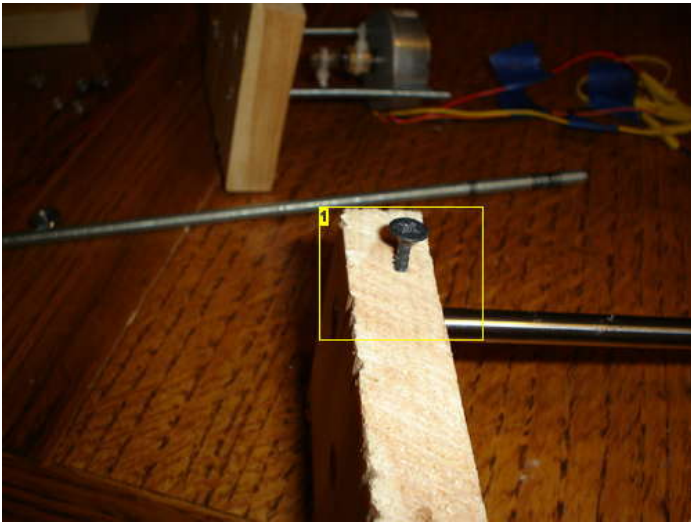


Image Notes

1. Screw the rod in place

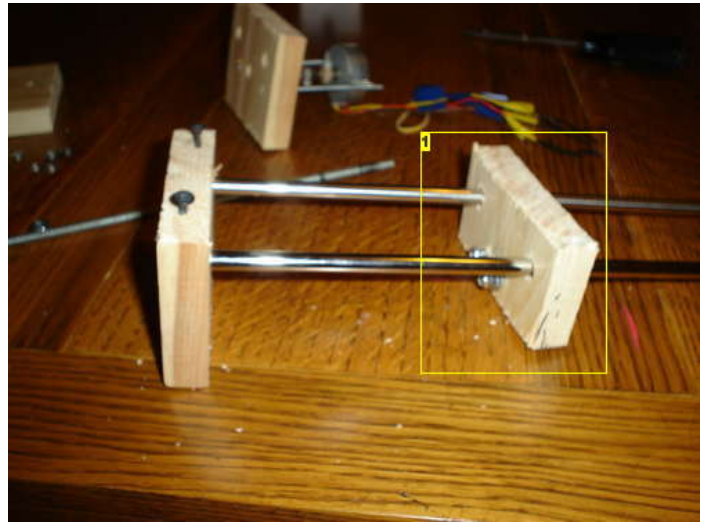


Image Notes

1. Slide the second piece of wood onto the rods

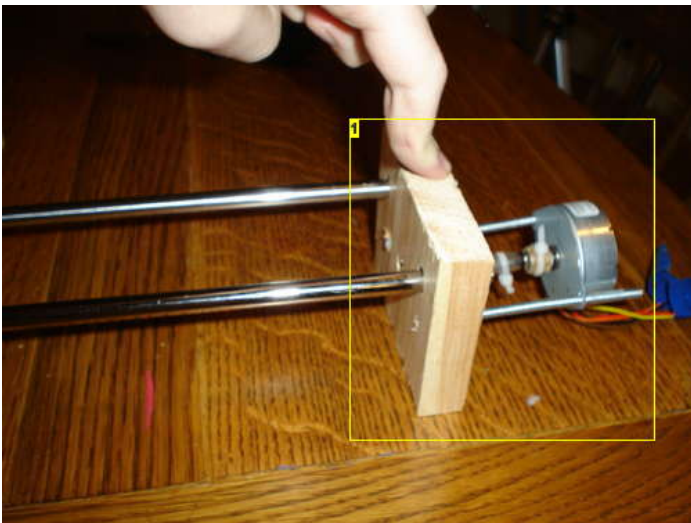


Image Notes

1. Slide the third piece of wood onto the rods

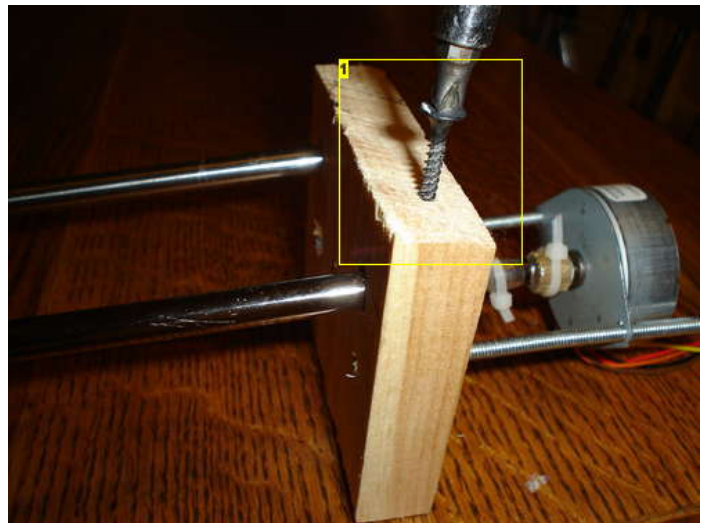


Image Notes

1. Screw it in place

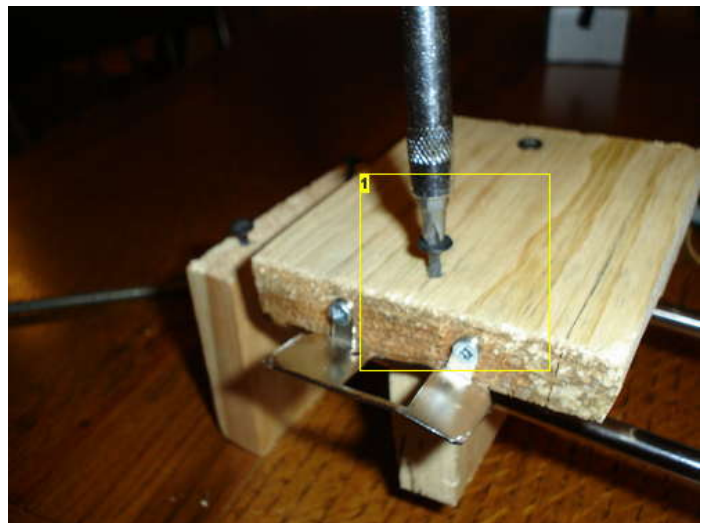


Image Notes

1. Screw the stage to the 2nd piece of wood

Image Notes

1. My stage was un-even, so I used washers to even it out

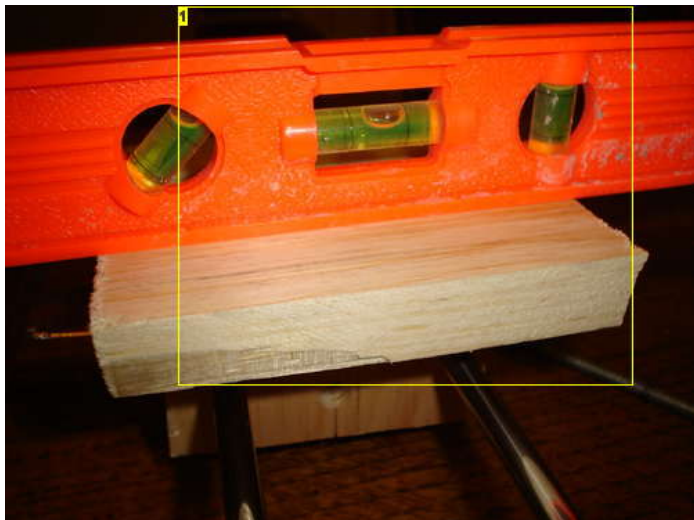


Image Notes

1. Make sure it is relatively level

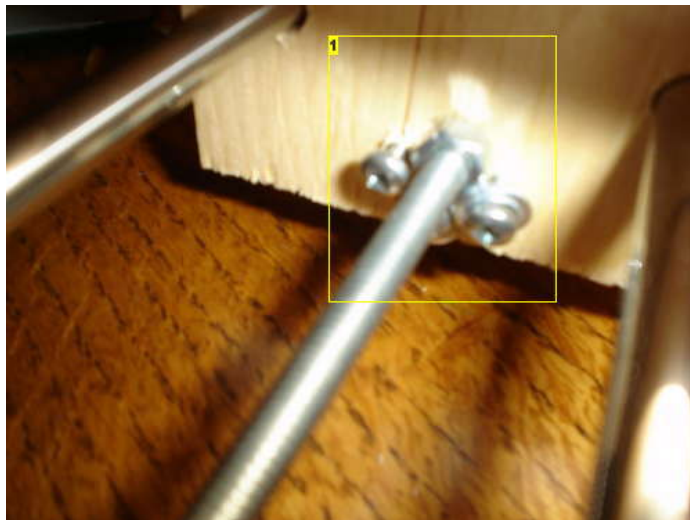


Image Notes

1. Use screws and washers to hold the nut in place

step 8: Conect and Test Motor

Now you need to connect the motor to the controller. First, connect the common wire (refer to your motor's datasheet) to the wire that you soldered to positive. Connecting the next four wires is a matter of trial and error. Connect them all and then change their order if your motor is taking two steps forward and one step back or something similar.

To test it, connect your 12 volt 300ma dc adapter into your barrel jack. Then, connect your DB25 port into your computer. Open the attached program in TurboCNC to test your motor wire connections. When you are done testing and changing your connection you should have a fully working axis.

To test the scale of your machine, attach a marker to your machine and run the test program. Measure the line. If yours is 1 inch long, or close to it, then your machine is good to go. If it is off, check your math. If you have made it this far, congratulations, the hardest part is done.

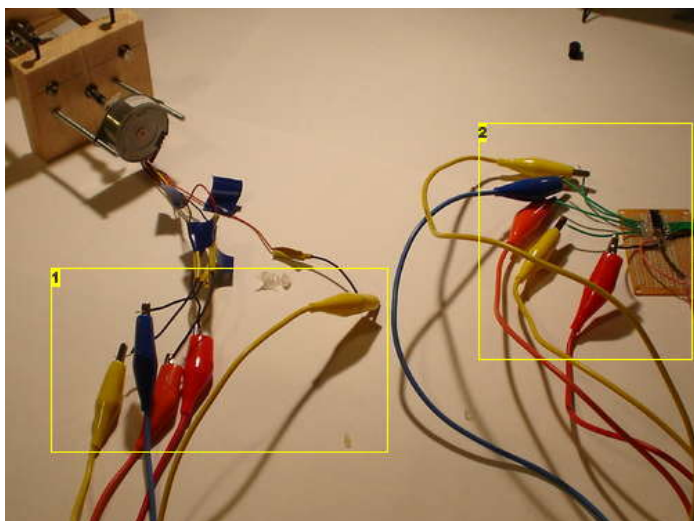


Image Notes

1. Alligator clips attached to motor leads
2. Alligator clips attached to board

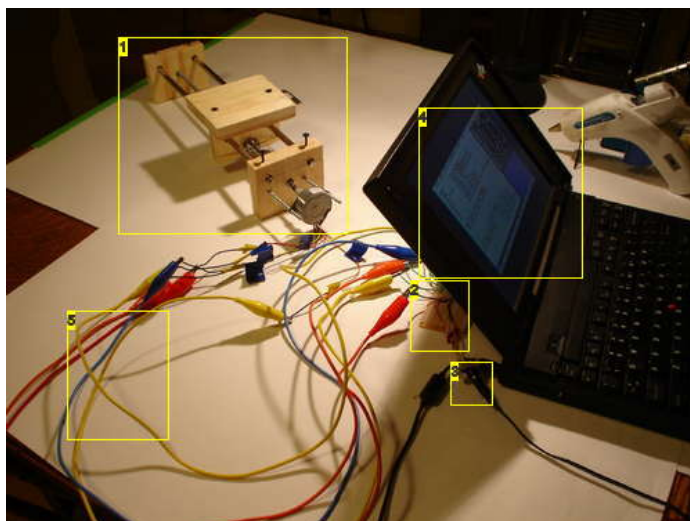


Image Notes

1. Test axis
2. Controller
3. 12 volts to controller
4. Computer running TurboCNC
5. Lots of wires

File Downloads



TEST.CNC (18 bytes)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TEST.CNC']

http://www.instructables.com/id/Easy_To_Build_Stepper_Controller_from_a_Recycled_M/

step 9: Make the Enclosure Part 1

Building an enclosure is the final step. I chose to make mine out of recycled cardboard because it is better for the environment than buying a brand new plastic one. Also, since the driver is built mostly from recycled parts, it makes sense that the enclosure should be made of recycled material too. My circuit board measured about 2 inches by 3 inches, so I decide to make my enclosure 3 inches by 4 inches by 2 inches to make room for the connectors.

Now you need to cut your panels. Cut two rectangles that are 3 inches by 4 inches, 2 rectangles that are 2 inches by 4 inches and two panels that are 3 inches by 2 inches (see pictures). Now you need to cut the holes for the ports and plugs. Trace your parallel port plug on one of the 4x2 inch sides. Cut it out. On the same side, trace your dc barrel connector. Cut that out too.

What you do in this step depends on if you soldered connectors to your motor connection wires. If you did, mount your connectors on the outside of your blank 4x2 inch panel. If you just used wires, poke 5 holes. Now, using hot glue, glue all of the panels together (except the top one, see pictures). I chose to paint mine silver.



Image Notes

1. Meter Stick
2. Pen
3. Scissors
4. Box

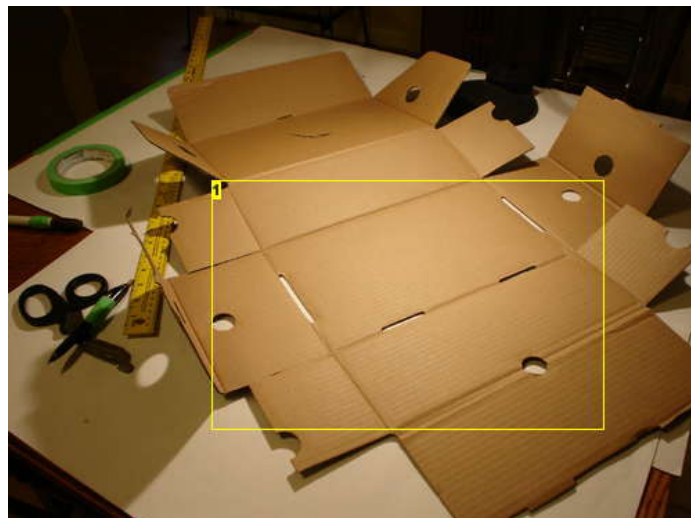


Image Notes

1. Flatten your box

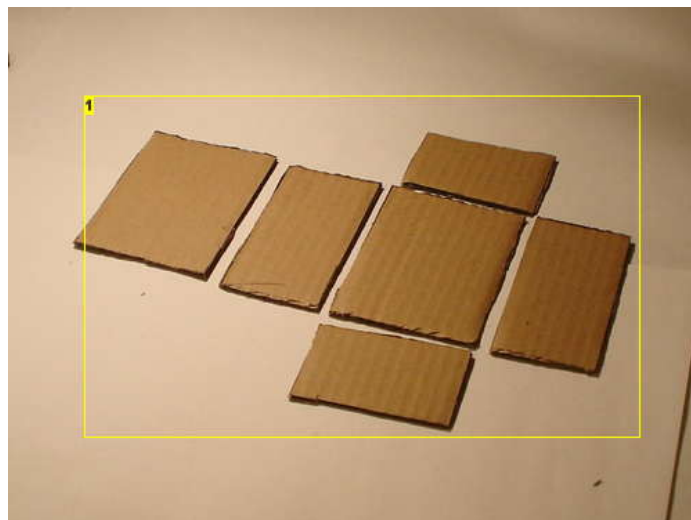


Image Notes

1. The pieces

Image Notes

1. 2 2 by 3 panels
2. 2 2" by 4" panels
3. 2 3" by 4" panels

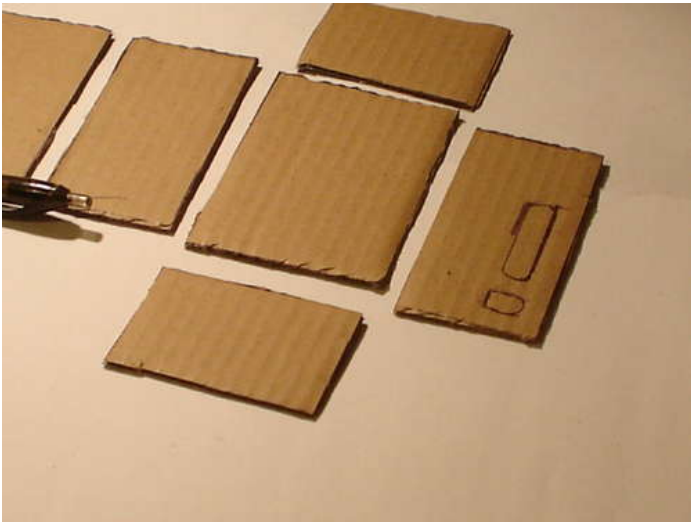


Image Notes
1. Cut them out

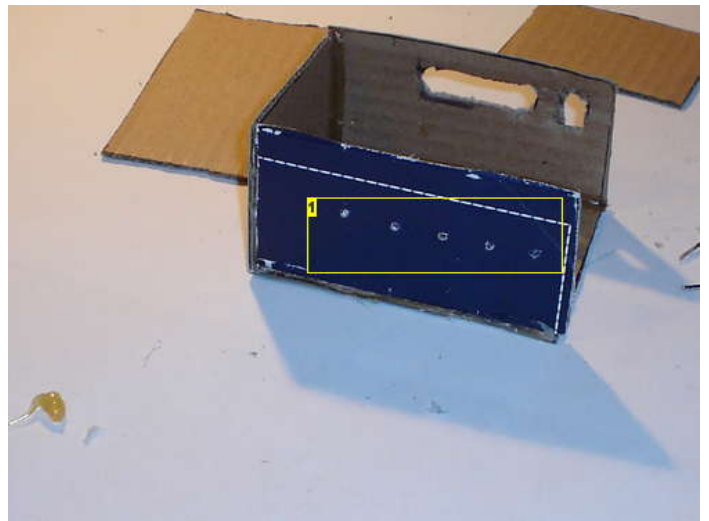
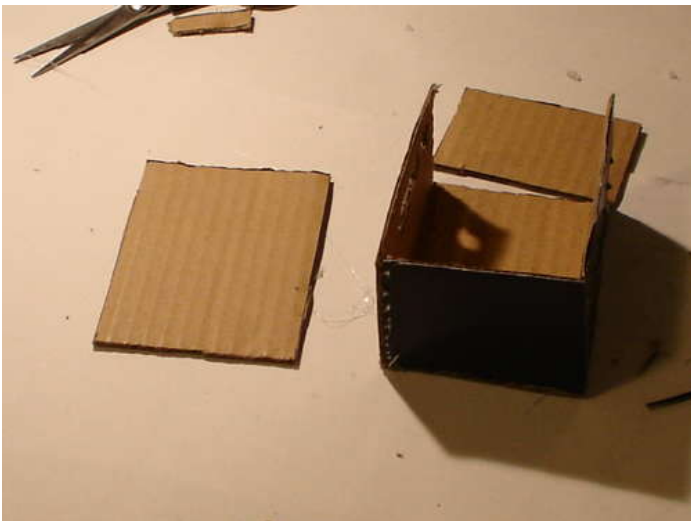
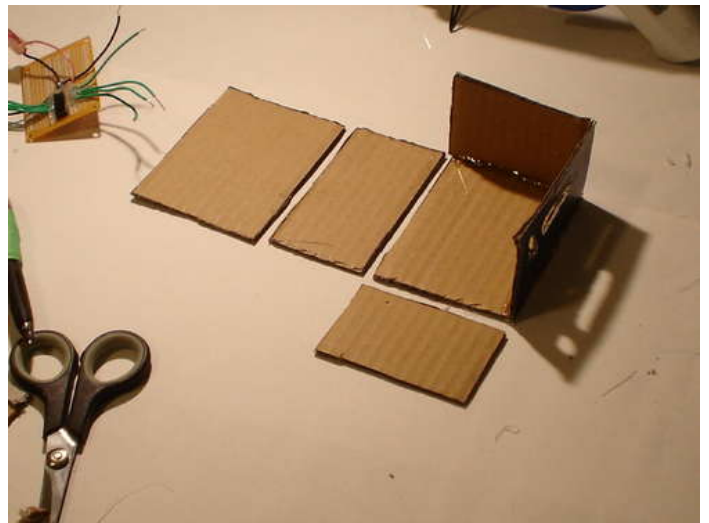
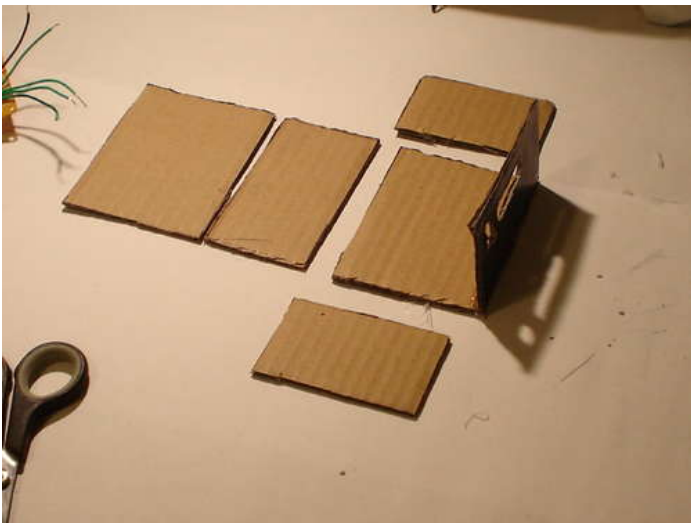


Image Notes

1. Holes for motor outputs



Image Notes

1. Test the fit

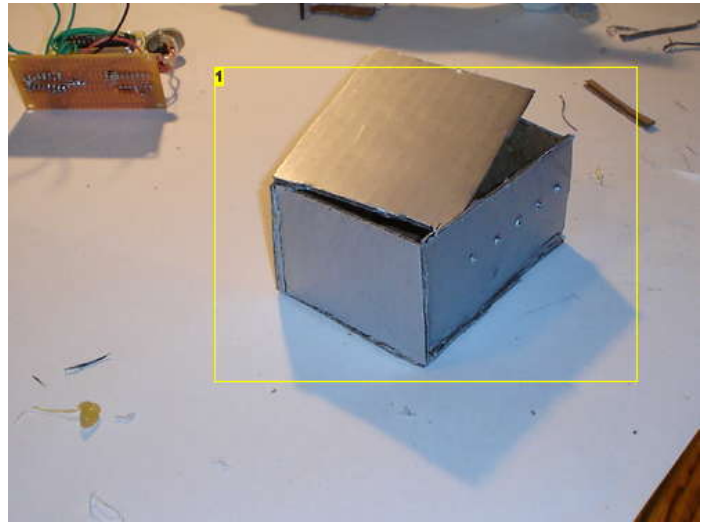


Image Notes

1. Paint it



step 10: Make the Enclosure Part 2

Now you must glue the components inside the enclosure. Be sure to put lots of glue on the plugs as they will be exposed to lots of force. To keep the box closed, you need to make some latches. You need to cut two tabs out of craft foam. Next, cut two strips of foam and four small squares. Glue two of the squares to each strip as shown in the photos. Glue a tab to each side of the enclosure. Glue the strips to the top of the box. This concludes building the enclosure.

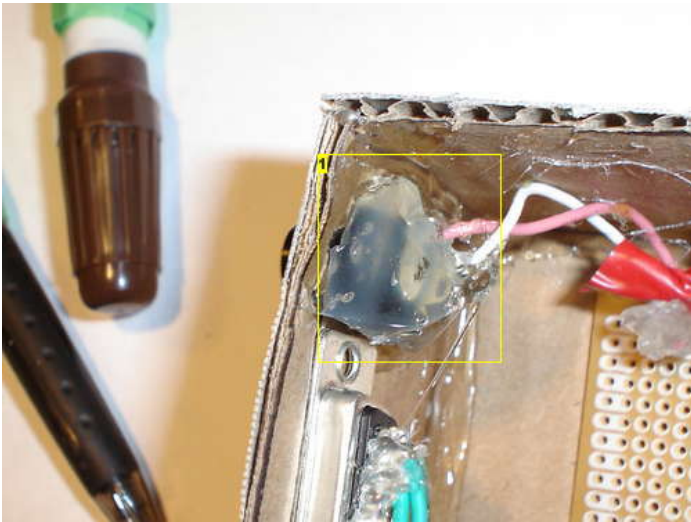


Image Notes

1. Put lots of glue on the plugs

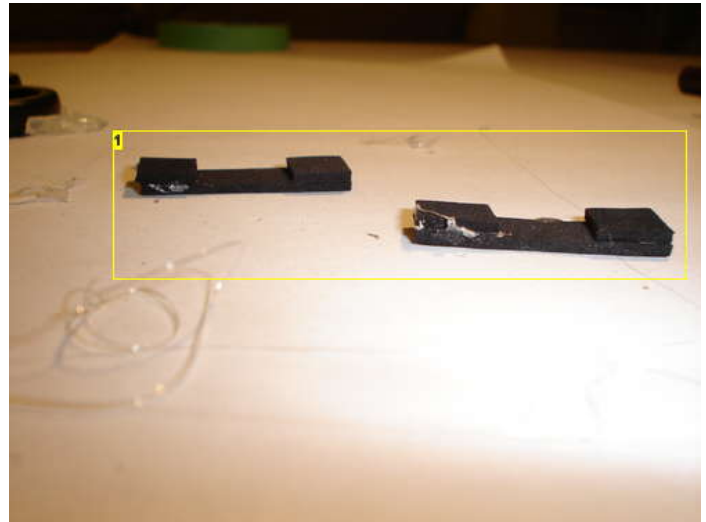


Image Notes

1. Glued together

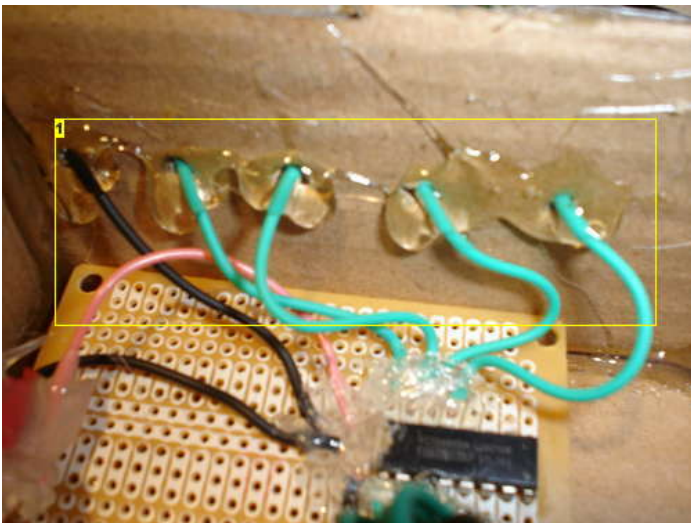


Image Notes

1. Glue the wires for the motors

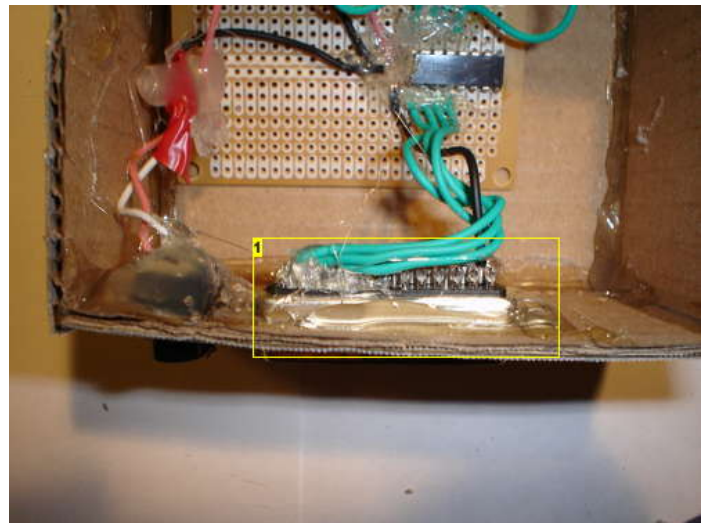


Image Notes

1. Put lots of glue here

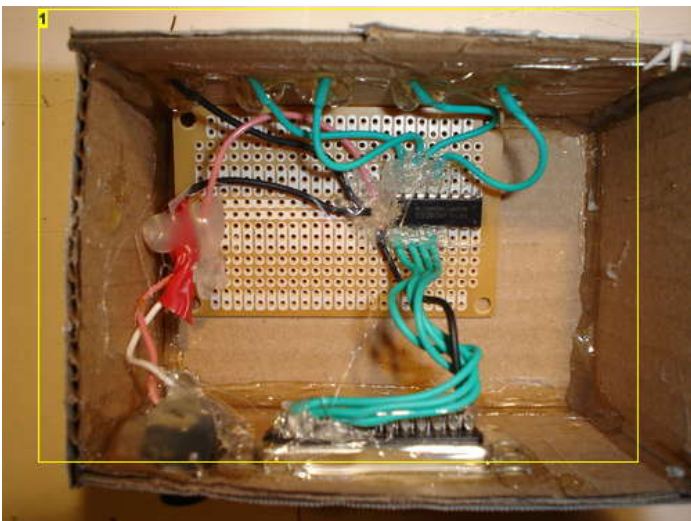


Image Notes

1. Everything is glued in place

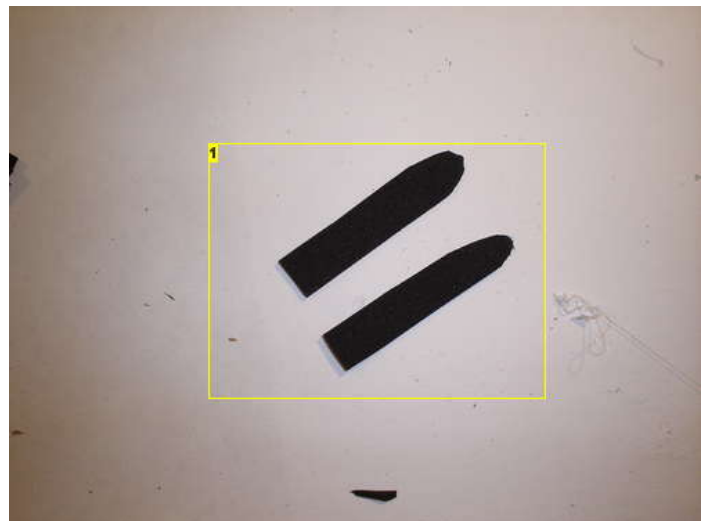


Image Notes

1. The tabs

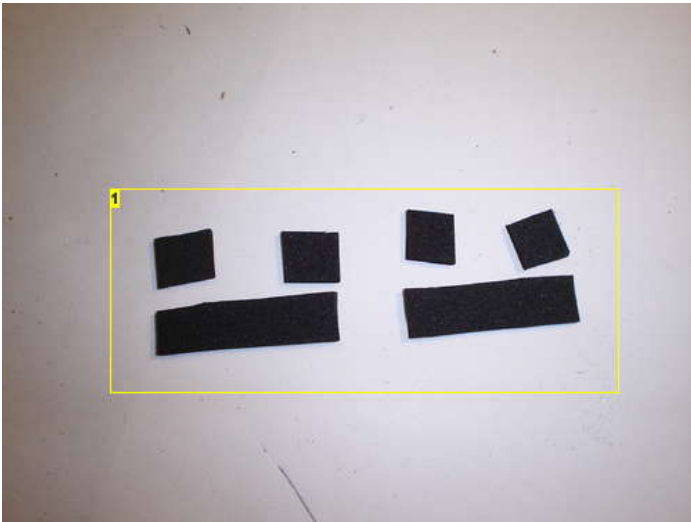


Image Notes
1. The tab holders

Image Notes
1. Glue the tabs to the box

Image Notes
1. Finished

step 11: Possible Uses and Conclusion

Possible uses of this controller could be:

- A cnc machine (build 3)
- Plotter (build 3)
- or anything else that requires a percise amount of movment.

This Concludes my instructable. I hope you found it interesting and helpful. Feel free to modify my design and let me know how it turned out. If you liked my instructable, please vote for it in the Epilog Laser Cutter Contest.

~Update~

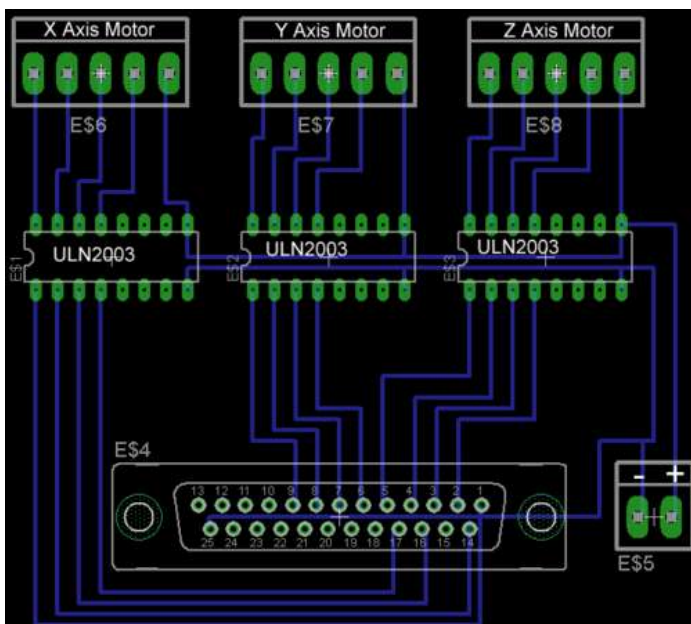
Here is the three axis setup instructions and schmatic

To configure the program, follow to above steps, except when you go to enter the number of axis', enter 3. For the configuration, follow the steps above for the first axis, for the second axis, keep it the same as the above steps, except in the first four phase lines, enter the following:

```
"XXXX1000XXXX
XXXX0100XXXX
XXXX0010XXXX
XXXX0001XXXX"
```

For the last axis, follow the same steps of the other axis', only copy this into the first four phases

```
"XXXXXXXX1000
XXXXXXXXX0100
XXXXXXXXX0010
XXXXXXXXX0001"
```



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maxpower49 says:

how would you have 3 axi, axis, axes? and what is plural of axis?

Apr 19, 2009. 5:12 PM [REPLY](#)



murray484 says:

Apr 20, 2009. 5:01 AM [REPLY](#)

To answer your first question, You need to build the three axis version. In the last step, there are some instructions and a schmatic. To answer your second question, according to WikiAnswers, the plural of axis is "Axes (pronounced 'ack-sees')".



Derin says:

May 18, 2009. 11:23 AM [REPLY](#)

They are very sharp too.



snowpenguin says:

May 12, 2009. 7:31 PM [REPLY](#)

This is great. You saved my butt!



z3r050u1 says:

May 12, 2009. 4:58 AM [REPLY](#)

thanks... was wondering cause all our copiers have these chips on there stepper controller boards and for the most part only these... i seem to have all the parts for making these things except i cant find any info on how to make these boards work outside of these copiers or just how to use the parts.... any advice....



z3r050u1 says:

Apr 24, 2009. 1:34 AM [REPLY](#)

Would it be able to do this project with a td62003ap
Cause a have alot of those lying around...
Thanks ..



mickydej says:

May 1, 2009. 11:45 AM [REPLY](#)

td623008ap OR it's replacement code HA16107P/FP, HA16108P/FP is a "PWM Switching Regulator for High-performance Voltage Mode Control", or at least that's what datasheet.org says about it.

You need an H-Bridge / Darlington to be able to control stepper motors.

Examples:

ULN2003 or ULN2004

L293D

SN754410NE



libed91 says:

May 1, 2009. 4:44 AM [REPLY](#)

Does anyone know where could I find controller for four wire stepper?



avibank911 says:

Apr 21, 2009. 11:55 AM [REPLY](#)

hey thanks so much for this it really cleared alot of stuff up for me :-).

can this work with cadbam and Mach3 cnc software?

can you use any size stepper motors for this.im wondering how such tiny motors could move a big cnc rig-im probably missing something as im quite new to this.

thanks again



murray484 says:

Apr 21, 2009. 6:50 PM [REPLY](#)

This will work with CAM BAM, because it is CAM software. CAM software is the software that creates G-Code (the code that runs the machine). Mach3 will not work as it only supports step/direction pulses, not phase pulses like this controller uses. Therefore, TurboCNC is the only software that I know about.

To answer your second question, I have heard that you can only use motors under a certain current (0.5 amps I think).

The reason why you can use such small motors for some cnc machines is because they are very small (eg. 12"x12").

Hope this clears things up.



0xCyrusx0 says:

Apr 21, 2009. 7:45 AM [REPLY](#)

Great job with this, not only did you show how to do it, you actually told us what program to use.

I've been waning to control things via parallel port for awhile, but there were never very many good instructions how how to go about doing so.

Now, however, with this, I'm thinking I'm going to control a few things in my room, and probably attempt to make a CNC machine of some type.

Thanks for this-



mman1506 says:

Apr 20, 2009. 4:02 PM [REPLY](#)

one of my stepper motors has 4 wires .

blue
white
yellow
orange

will this work for it



stuuf says:

4-wire stepper motors are the "bipolar" type; this circuit appears to be for unipolar (5- or 6-wire) motors only. The difference is that a unipolar motor has 4 coils, each of which carries current in only one direction to a common ground, while the 2 coils in a bipolar motor are alternately driven in both directions. Therefore you need 2 full H-bridges (TA84007 or similar chips) instead of just a single transistor on each wire for each motor.

Apr 20, 2009. 7:19 PM [REPLY](#)



mman1506 says:

dang, 7 bucks down the drain. it is a very odd scanner it has usb and..gameport not parallel, gameport

Apr 20, 2009. 8:10 PM [REPLY](#)



mman1506 says:

can you give me a file of schematic and board

Apr 18, 2009. 8:41 AM [REPLY](#)



mman1506 says:

also for three axis does it need 3x the voltage

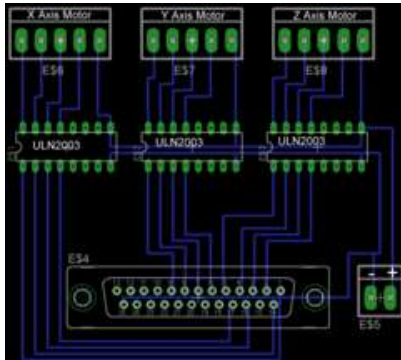
Apr 18, 2009. 8:52 AM [REPLY](#)



murray484 says:

I attached the schmatic for the three axis board. I think that the three axis does not need 3x the voltage, but it does need 3x the current (I think). Check <http://www.cnczone.com> for more answers. There are plenty of experts who have helped me many times.

Apr 18, 2009. 10:15 AM [REPLY](#)



mman1506 says:

it seems that its giving me a picture instead of file, do you have .sch and .brd etc files.

Apr 18, 2009. 1:07 PM [REPLY](#)



murray484 says:

Sorry, here is the .brd file. Good luck.

Apr 18, 2009. 3:17 PM [REPLY](#)



driver.brd 11 KB



morareduard says:

for some reason eagleCAD does not recognize this format, can you help me? Thanks a lot

Apr 20, 2009. 2:36 AM [REPLY](#)



murray484 says:

I am not really sure. What version of eagle are you using? I used 5.3.0. Try updating eagle.

Apr 20, 2009. 5:03 AM [REPLY](#)



morareduard says:

I have 5.4.0 and when I try downloading the .brd file it saves it as a .tmp file and I can not open it.

Apr 20, 2009. 6:48 AM [REPLY](#)



mman1506 says:

instructables converts files into .tmp files just rename it stepper controller.brd and it will give you a warning then just hit ok, it will now be a .brd file

Apr 20, 2009. 7:15 AM [REPLY](#)



morareduard says:
Thank a lot ! appreciate it.

Apr 20, 2009. 8:39 AM [REPLY](#)



maxpower49 says:
so in order to run the soft ware you can only have a maxum of windows 98 nothing newer

Apr 19, 2009. 1:17 PM [REPLY](#)



murray484 says:
Not exactly. In order to be able to use windows XP, you need to create a start up disk. Do do this, refer to the post farther down on the page, or refer to the turbocnc manual.

Apr 19, 2009. 2:40 PM [REPLY](#)

Good luck



Derin says:
How would I use the 3rd axis to control a laser?

Apr 18, 2009. 6:29 AM [REPLY](#)



murray484 says:
You would only need to build the X and Y axis' , then use something like a Solid State Relay to control the laser. I have no experience with this, so I do not know how to setup the program. Try googling "DIY CNC Laser cutter".

Apr 18, 2009. 7:47 AM [REPLY](#)

Hope this Helps



Derin says:
Thanks.I will try using diodes to connect the laser to the Z stepper connection.

Apr 19, 2009. 12:21 AM [REPLY](#)



alex-sharetskiy says:
Epic Win!

Apr 18, 2009. 7:41 PM [REPLY](#)

Not only did you show how to make the controller, but you also told us what program to use!



ReCreate says:
Oh wow this is interesting,you could do this within windows in DOSbox There is a way to get the physical Parallel port to the emulated machine,i'm not sure how but if that works you wont have to be stuck in dos all the time
I just realised that i have a stepper motor myself,i think,i found it in a floppy drive,and it had 4 wires,thats what it is.

Apr 18, 2009. 2:31 PM [REPLY](#)



mman1506 says:
i was just looking around and isn't this the same as <http://www.instructables.com/id/Laser-cutter-start-slicing-stuff-for-under-50-doll/> the both us uln2003 chip
ecept that one dosent metion you can get it in the scanner

Apr 18, 2009. 1:19 PM [REPLY](#)



mman1506 says:
could i control this with linux cause all i have is my homemade ubuntu computer with db25

Apr 17, 2009. 4:46 AM [REPLY](#)



mman1506 says:
or can i use usb -db25 adapter or would that cause mixed steps

Apr 17, 2009. 4:48 AM [REPLY](#)



murray484 says:
At the moment, I am pretty sure that TurboCNC is the only software that would work with this controller. I am pretty sure that a usb to parallel adapter will NOT work, as it would throw off timing of steps. You can run TurboCNC from the live cd of FreeDOS. Check it out at <http://www.freedos.org/> .

Apr 17, 2009. 2:19 PM [REPLY](#)

Hope this helps



zimmemic25 says:
you can always program your own controller. because parport is the connection which is easiest to control.
just open the device stream and set the pins you want to.

Apr 18, 2009. 12:55 AM [REPLY](#)



mman1506 says:
but that ruins the simplicity of it .i actually ran turbo cnc on vista and it actually works quite well and my favourite out of the other ones,i especially like the jog mode were you can control the axis with you keyboard

Apr 18, 2009. 8:59 AM [REPLY](#)



hurtzmyhead says:

you could use <http://www.linuxcnc.org/> for the software, and i think the hardware would stay the same as long as you have a serial port

Apr 17, 2009. 10:05 AM [REPLY](#)



zimmemic25 says:
its parport.

Apr 18, 2009. 12:56 AM [REPLY](#)



mman1506 says:
could i add a second axis

Apr 16, 2009. 7:40 PM [REPLY](#)



murray484 says:

Yes, you can add a second axis. Just build the three axis version posted below (I'll try to post it in the last step), only leave one chip out.

Apr 17, 2009. 2:20 PM [REPLY](#)



ReCreate says:

Wow,that's the oldest computer i have seen.
Your so lucky to have such a nice computer,i only have one...and its broken.(Motherboard problem)
This is really quite interesting,But i like stepper motors for generator use better than spinning them.

Mar 28, 2009. 7:49 PM [REPLY](#)



mman1506 says:
then what are you using now

Apr 16, 2009. 7:36 PM [REPLY](#)



ReCreate says:

Ah my mistake,i only had one laptop,an old(not as old as the one in this ible) 400MHz Pc with XP,im waiting for my new mainboard to come in the mail.
Know i found another in the trash,1.6GHz,512MB of ram(good things come to those who dig in the trash)
If you want to know more look for plasmanas free stuff ible

Apr 16, 2009. 8:33 PM [REPLY](#)



mman1506 says:
great instructable im gonna try this soon

Apr 16, 2009. 7:29 PM [REPLY](#)



tmcalhoun says:

i am stuck what do i do after i input all the data on the screen to look just like yours and then have the electronics all hooked up? What do i do to get it working?

Apr 13, 2009. 4:23 PM [REPLY](#)



murray484 says:

In the program window, you can input commands like "G00 X1.00", Then run the program. This will move your motor 1 inch. You can change this command to make it go different distances. For example, if you type "G00 X4.00", it will move 4 inches. This is a basic G-Code command.

Apr 16, 2009. 6:25 PM [REPLY](#)

Hope this helps clear things up



purgedsoul says:

Nice instructable! I would suggest a diode or some protection for the parallel port. :-)

Apr 14, 2009. 8:16 AM [REPLY](#)



junits15 says:
cool

Apr 13, 2009. 2:59 PM [REPLY](#)



scotty3785 says:

The software looks interesting... are there any more modern programs that perform the same function?

Mar 3, 2009. 6:31 AM [REPLY](#)

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