

How to Make a Three Axis CNC Machine (Cheaply and Easily)

by [oomlout](#) on June 29, 2007

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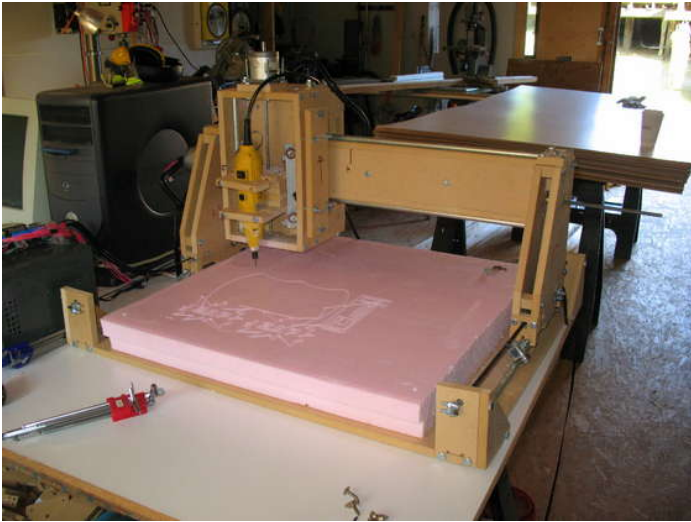
Intro: How to Make a Three Axis CNC Machine (Cheaply and Easily)

The idea behind this Instructable was to fulfill my desire for a desktop sized CNC machine. While it would have been nice to purchase an off the shelf unit the issue of price as well as size proved prohibitive. With this in mind I endeavored to design and build a three axis CNC machine with the following factors in mind:

- Use Simple tools (needs only a drill press, band saw, and hand tools)
- Low Cost (this kind of got away from me however with everything bought off the shelf the cost for all parts is under \$600 (significant savings could be made by skillfully sourcing some pieces))
- Small footprint (30" x 25" footprint)
- Usable working envelope (10" X-axis, 14" Y-Axis, 4" Z-Axis)
- Relatively fast cut rate (60" per minute)
- Small part count (fewer than 30 unique parts)
- Easy to source parts (all parts available from 4 sources (Home Depot + 3 online sources))
- Ability to cut ply-wood (Successful)

Lets get started...

UPDATE: - Coming soon the ability to order pre-cut MDF pieces from [oomlout](#)



step 1: Others Who Have Finished

A salute to those who have laboured through to this point (and to demonstrate that it is reproducible) Here are some pictures of other peoples machines.

Photo 1 - Chris and his friend put together this unit; laser cutting the parts out of half inch acrylic. Not only does it look super it must weigh a ton. But kudos, anyone who's worked with acrylic knows laser cutting it is great but it is a very very unfriendly material to drill and there is a lot of side drilling in this design. Good job guys, check out more details (and photos including some testing with circuit boards) on Chris's blog [rainbowlazer.com](#). I particularly like his work with making 3-d objects out of 2d cuts ([here](#)) .

Photo 2 - Sam McCaskill has finished his desktop CNC machine and it's looking really really nice. Super impressively he also resisted the urge to cheat and cut all his pieces by hand. I'm really impressed.

Photo 3 - Angry Monk's - With MDF pieces cut on a laser cutter and drive converted from toothed belts to threaded rod

Photo 4 - Bret Golab's - Bret has completed his and gone through the extra step of getting it setup to work with Linux CNC (a task I attempted and was foiled by complexity). If you're interested in his settings you can send him a message (Instructable ID: [bretlyssii](#)). Great job Bret!

(If you have built one and would like it featured here, please send me a PM and we can arrange for the sending of photos)

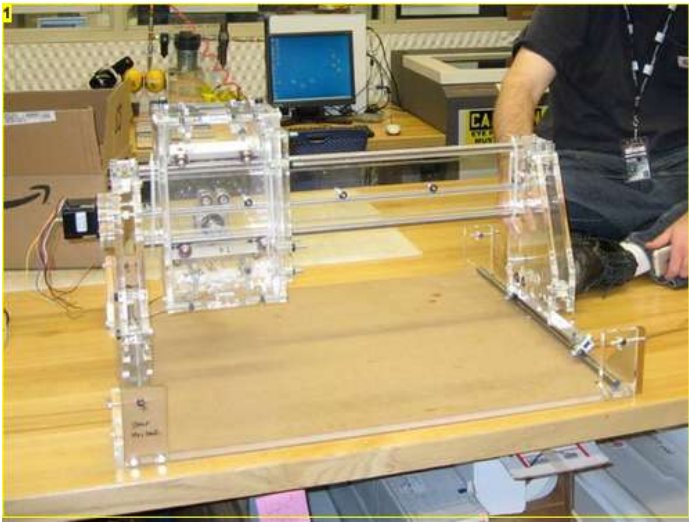


Image Notes

1. Cris and his friends finished CNC machine. Check out more details about this build at RainbowLazer.com

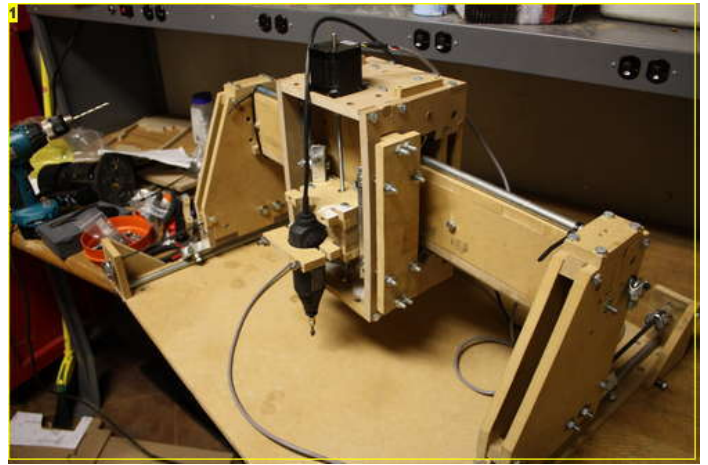


Image Notes

1. Photo 1 - Sam McCaskill's Finished (handcut) Machine

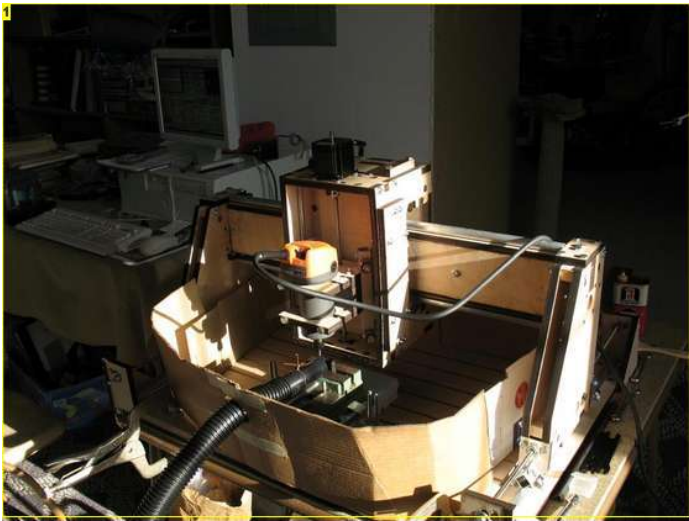


Image Notes

1. Photo 2 - Angry Monk's Finished Machine.



Image Notes

1. Photo 3 - Bret Golab's

step 2: Specs.

I'm afraid I don't have the space (or the expertise for that matter) to go into the fundamentals of CNC here but there is one website in particular I found quite useful in my research.

CNCZone.com - A discussion forum which has a DIY machine section which is a wealth of knowledge ([direct link](#))

Machine Details:

Cutting Head: Dremel or Dremel Type Tool

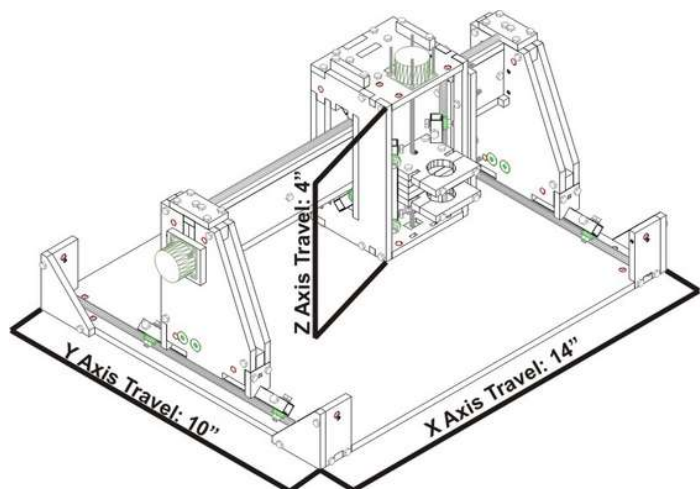
Axis Details:

X Axis
 travel: 14"
 Drive: Toothed Timing Belt
 Speed: 60" min
 Acceleration: 1" per second²
 Resolution: 1/2000"
 Pulses Per inch: 2001

Y Axis
 Travel: 10"
 Drive: Toothed Timing Belt
 Speed: 60" min
 Acceleration: 1" per second²
 Resolution: 1/2000"
 Pulses Per inch: 2001

<http://www.instructables.com/id/How-to-Make-a-Three-Axis-CNC-Machine-Cheaply-and/>

Z Axis (up down)
Travel: 4"
Drive: Threaded Rod
Acceleration: .2" per second²
Speed: 12" min
Resolution: 1/8000"
Pulses Per Inch: 8000



step 3: Required Tools

The goal was to try and keep the tools required within the realm of an average handyman's shop.

Power Tools:

- Band Saw or Scroll Saw
- Drill Press (drill bits 1/4", 5/16", 7/16", 5/8", 7/8", 8mm also Q (5/16" closest imperial drill bit)
- Printer (seemed like the right category)
- Dremel or Similar Tool (to attach to the finished machine)

Hand Tools:

- Rubber Mallet (to provide "persuasion" when necessary)
- Hex Keys (5/64", 1/16")
- Screw Driver
- Glue Stick (UHU) or spray adhesive
- Adjustable Wrench (or 7/16" socket and ratchet)



step 4: Required Parts

The attached PDF (CNC-Part-Summary.pdf) provides detailed cost and sourcing information for each and every required part. Listed here is only a summary

Sheet Stock --- \$20

- a 48" x 48" piece of 1/2" thick MDF (any 1/2" sheet stock can be used I have plans to make my next version out of UHMW but cost was prohibitive this time around)
- a 5"x5" piece of 3/4" thick MDF (this is used to make spacers so any piece of 3/4" stock found around the shop could be used)

Motors and Controllers ---- \$255

-An entire instructable could be written on choosing a controller and motors. In short what is required is a controller capable of three axes of control (with pulsed step and direction inputs) and motors with about 100 oz/in holding torque. I sourced mine from <http://hobbycnc.com> they have worked well and the kit was quite easy to solder. ([direct link](#))

Hardware--- \$275

-These parts can be acquired from three places. The conventional items can be acquired at Home Depot, the specialty drive products are easy to find at any industrial supplier, I used McMaster Carr (<http://www.mcmaster.com>) (I chose them because they have a nice online store), and finally because of the large number of bearings required I found the best price from an online seller (<http://vxb.com>) which sells 100 for \$40 (leaves quite a few left over for other projects) ([direct link](#))

Software --- (free)

-What is required is a program to draw your designs (I use CorelDraw), and a programme capable of interpreting these files into pulses to be sent to your controller. I'm currently using a trial version of Mach3 (<http://www.machsupport.com>)but have plans to convert to LinuxCNC (An open source machine controller which uses linux) (<http://www.linuxcnc.org>)

Router Head--- (extra)

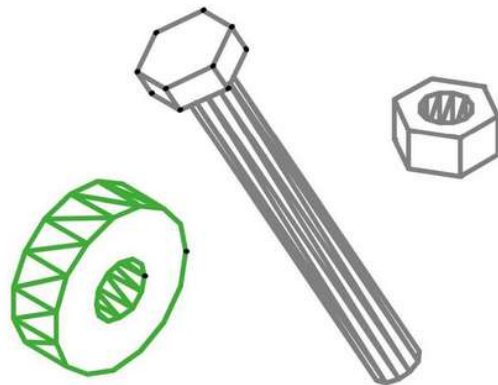
-I attached a dremel type cutting tool to my machine however if you are more interested in additive construction (like fab@home or RepRap) you may wish to look into their deposition tools.

Details

- the metric components and especially the cross nuts aren't very popular and I had to visit several Home Depots in my area before I had enough.
- I couldn't find a way to link to parts directly on the MCMaster Carr site. To find them go to www.mcmaster.com and search for the part #



Three Axis CNC Machine Part Summary



Required Parts:

Summary:

Number of Parts: 26
Number of Suppliers: 4
Total Cost: \$551.05

Note: McMaster Carr Industrial Supply website <http://www.mcmaster.com>

Bolt (2" x 0.25")	Required: 76		
	Source	Cost ea	Total
	Home Depot	\$0.24	\$18.24

Bolt (3.5" x 0.25")	Required: 8		
	Source	Cost ea	Total
	Home Depot	\$0.49	\$3.92

Bolt (1.25" x 0.25")	Required: 11		
	Source	Cost ea	Total
	Home Depot	\$0.20	\$2.20

File Downloads

<http://www.instructables.com/id/How-to-Make-a-Three-Axis-CNC-Machine-Cheaply-and/>



C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Part-Summary.pdf (162 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Part-Summary.pdf']

step 5: Printing Pattern

I had some experience Scroll Sawing pieces so I choose to use a glue on pattern method. What is required is to print out the PDF pattern files onto tiled pages, then glue on each pattern, and cutout each piece.

File Name and Material:

- Summary: CNC-Cut-Summary.pdf
- 0.5" MDF (35 8.5"x11" tiled pages): CNC-0.5MDF-CutLayout-(Rev3).pdf
- 0.75" MDF: CNC-0.75MDF-CutLayout-(Rev2).pdf
- 0.75" Aluminum Tube: CNC-0.75Alum-CutLayout-(Rev3).pdf
- 0.5" MDF (1 48"x48" page): CNC-(One 48x48 Page) 05-MDF-CutPattern.pdf

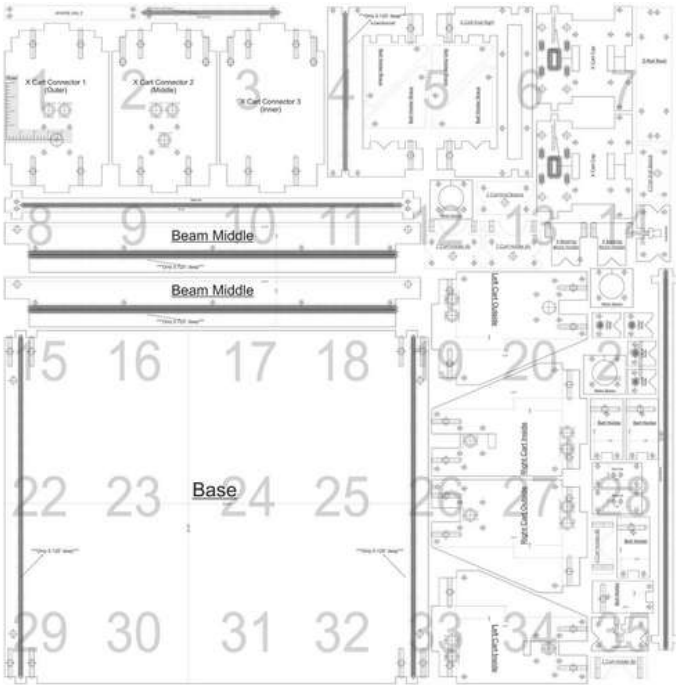
(note: I've added a DXF version of the 0.5" MDF pattern to this step (DXF-05-MDF-SimpleDXF.dxf) I have removed the cross drilled holes and writing from this file to make it a manageable size, if anyone would like any of the drawings in a different format or including different information please just drop me a line and I'll do what I can)

(note: I've included the original CorelDraw format drawings in a zip file (CNC-CorelDrawFormat-CutPatterns(Rev2).zip) for anyone who wishes to do some editing)

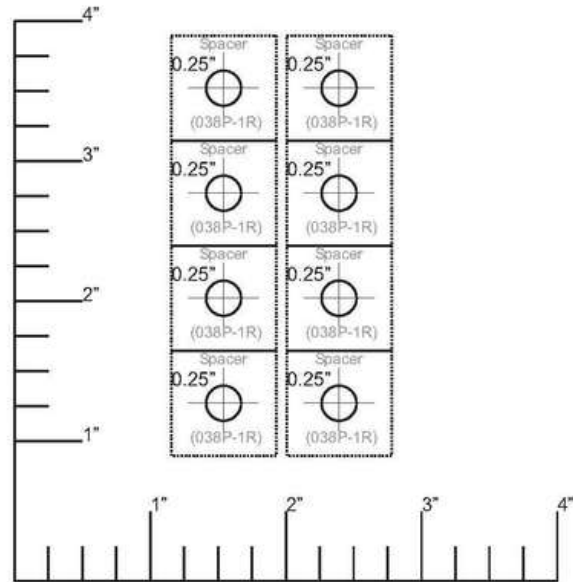
(UPDATE: There is now a choice in patterns for the 0.5" MDF layer, you can download one file (CNC-0.5MDF-CutLayout-(Rev3).pdf) with 35 8.5"x11" pages tiled, or you can download one file (CNC-(One 48x48 Page) 05-MDF-CutPattern.pdf) which has the entire layout on one 48"x48" page to print on a large format printer or tile yourself)

(Step by step)

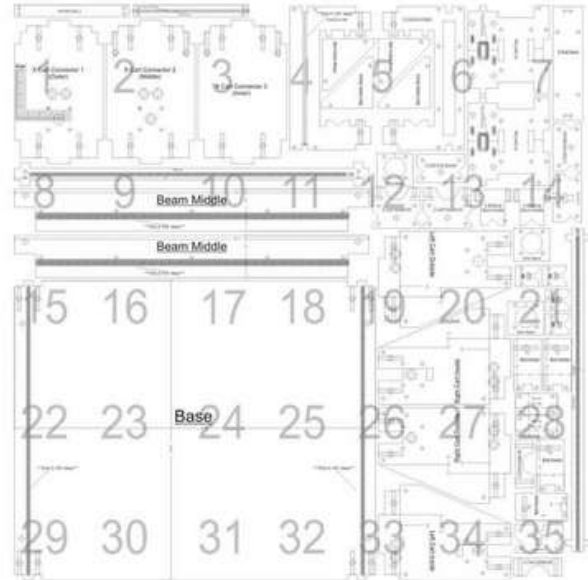
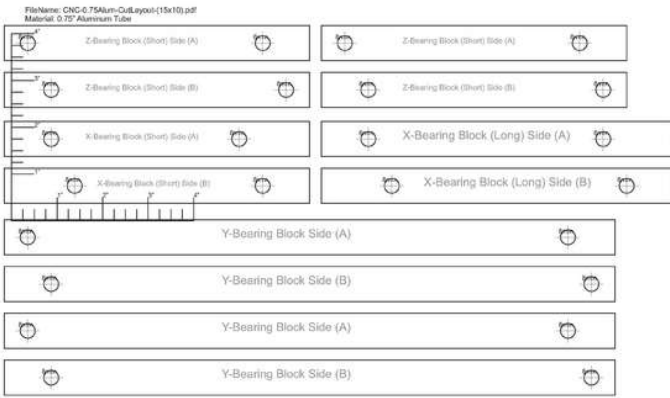
- 1.Download the three layout pdf files
- 2.Open each in Adobe Reader
- 3.Goto the Print Dialog
- 4.(IMPORTANT) in the page scaling dialog select "none"
- 5.Check to make sure the file didn't accidentally get scaled to do this measure the printed ruler on page one of each pattern (make sure it matches up with a ruler you trust) (I didn't do this the first time and accidentally printed out a copy at 90% size more on this later)



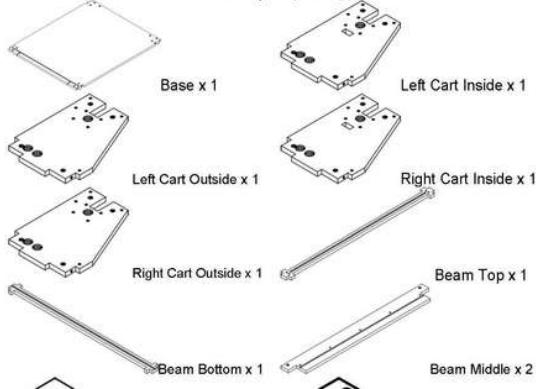
FileName: CNC-0.75MDF-CutLayout-(8x10).pdf
Material: 0.75" thick MDF




Three Axis CNC Machine Cut Summary





0.5" MDF (Cut from Pattern) (48" x 48") Cut Pattern PDF: CNC-0.5MDF-CutLayout-(48x48).pdf




File Downloads

 [C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Cut-Summary.pdf](#) (263 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Cut-Summary.pdf']

 [CNC-05-MDF-CutPattern\(Rev3\).pdf](#) (317 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'CNC-05-MDF-CutPattern(Rev3).pdf']

 [CNC-075-MDF-\(Rev2\)CutPatter...pdf](#) (13 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'CNC-075-MDF-(Rev2)CutPatter...pdf']

 [CNC-075-Aluminum-CutPattern\(Rev3\).pdf](#) (18 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'CNC-075-Aluminum-CutPattern(Rev3).pdf']



DXF-05-MDF-SimpleDXF.dxf (988 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'DXF-05-MDF-SimpleDXF.dxf']



CNC-CorelDrawFormat-CutPatterns(Rev2).zip (925 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'CNC-CorelDrawFormat-CutPatterns(Rev2).zip']



CNC-(One 48x48 Page) 05-MDF-CutPattern.pdf (72 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'CNC-(One 48x48 Page) 05-MDF-CutPattern.pdf']

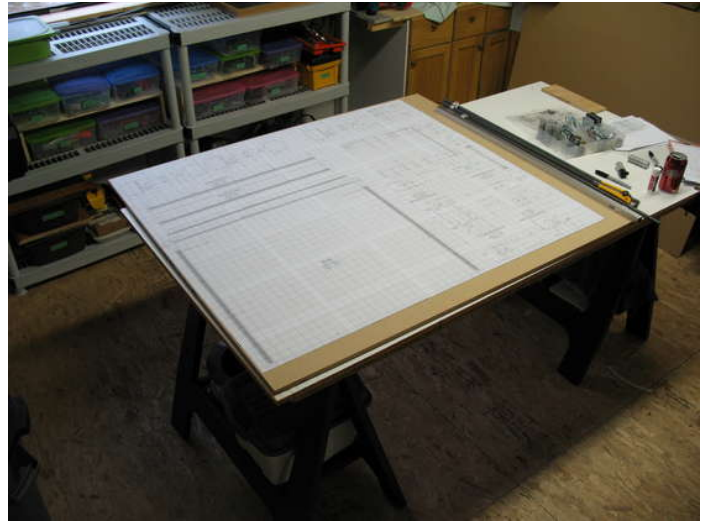
step 6: Gluing Down the Pattern

Next step is to Glue the pattern to the MDF stock and Aluminum Tubing

1. Glue the tiled pages to your sheet stock (MDF) ensuring the edges match up
2. For the aluminum tube the pattern must be glued to two sides. If the Tube is laying flat on a table and you glue the side A patterns to the top side B can be glued on either of the side faces.

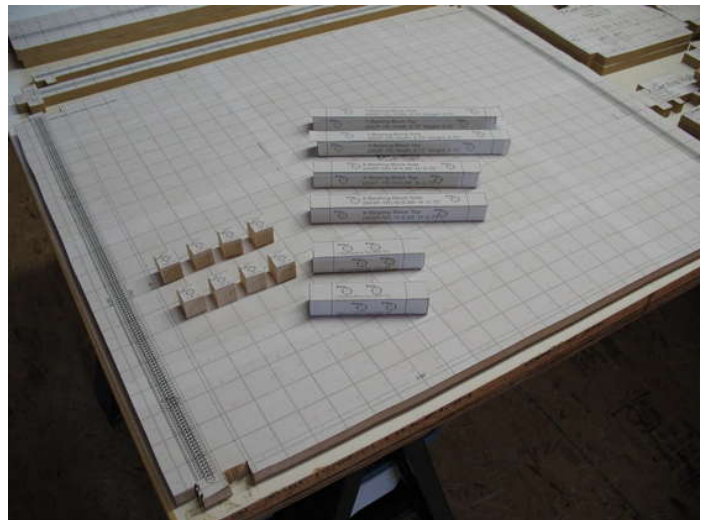
Tips:

- Use lots of glue
 - Have something near by to help push down each piece
 - Patience
- (if anyone else has tips on doing this I would love to hear them)



step 7: Cutout Pieces

Not too much to say for this step simply cut around each outline.



step 8: Cheating

I must apologize at this stage I succumb to the desire to cheat. As mentioned earlier I accidentally printed out my initial pattern at 90% size. Unfortunately I did not realize this until this stage. So left with a 90% scale set of pieces and having moved across country I was now within reach of a full size CNC router table. I gave in and cut my pieces using this machine. However it was unable to do the drilling of holes so back to the real steps (this is why all the pieces from here on out do not have paper patterns glued on them)

step 9: Hole Drilling

I have not counted but this project requires a lot of holes. The holes which are drilled into the edge of the material are particularly important so just take your time, you'll appreciate it later when you need to use the rubber mallet only sparingly.

The areas with holes drilled overlapping are an attempt to create grooves if you have a table router that would work much better for this.

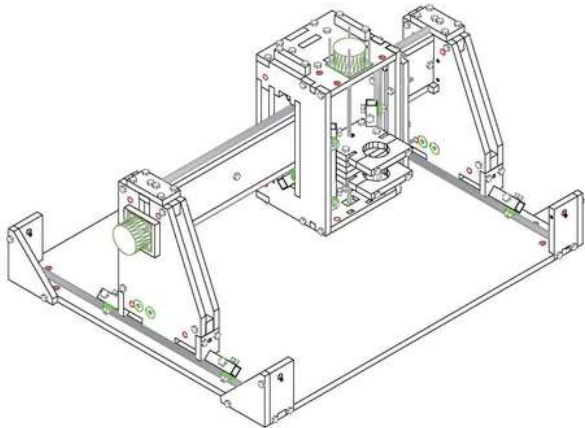


step 10: Assembling

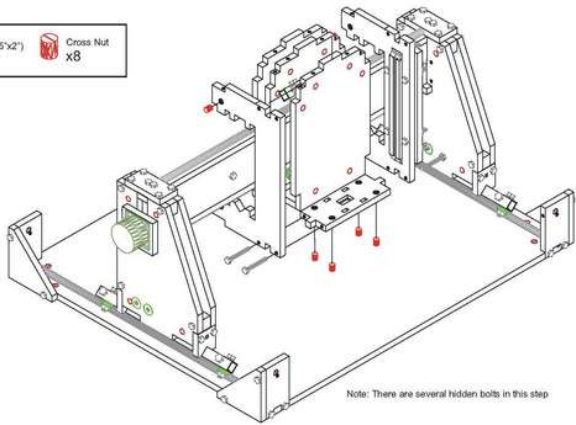
If you've made it this far I must offer my congratulations and suggest it only gets better from here. Looking at the pile of pieces picturing how it manages to become a machine may be a tad abstract so I tried my best to create instructions as close to those produced by LEGO. (downloadable in the attached pdf CNC-Assembly-Instructions.pdf). But in the interest of amusing along the way here is a timelapse of me putting my machine together.



Three Axis CNC Machine Assembly Instructions



16.  Belt (0.25"x2") x6  Cross Nut x8



Note: There are several hidden bolts in this step

File Downloads



C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Assembly-Instructions.pdf (786 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'C:\Documents and Settings\Aaron\My Documents\Plotter Stuff\00-Active\Instructable Files\CNC-Assembly-Instructions.pdf']

step 11: Software, Wiring and Configuring

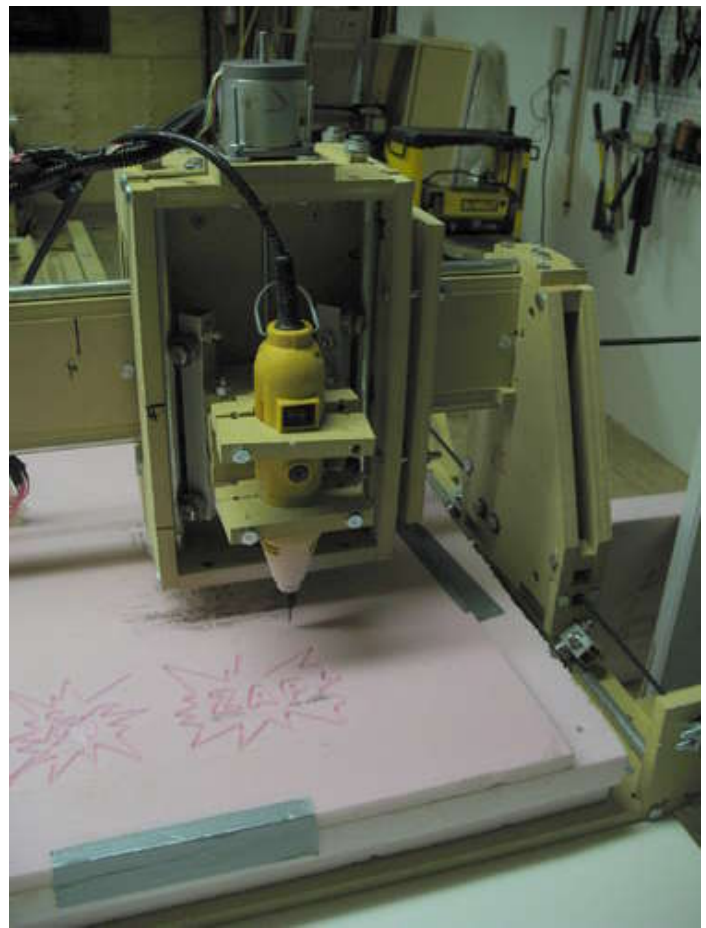
Almost there. All that is required is to wire up your motors and controller following their instructions, and to set up your control software using the included instructions and the machine specific details included here in step 2.



step 12: Finished

There you have it hopefully you are finished and ready to go into production. I hope I have not left out any crucial details but if you think of something you'd like to know which I have omitted please just ask. Finally to demonstrate that it all works a video of my machine cutting out a pattern in pink foam.





Related Instructables



3 Axis CNC Router - 60"x60"x5" - JunkBot by russaanderson



DIY CNC (guide) by noahw



CNC (guide) by noahw



Make a CNC Hot Wire Foam Cutter from parts available at your local hardware store by tbarnea



Open Manufacturing - (How to Build 30 (SERB) Kits) by oomlout



Homebrew Laser Cutter made by Zach Radding by TimAnderson



Dremel Carver/Duplicator like a Human Powered CNC Router by Adran



DIY prototypes (robots or art design), with homemade pieces (recycling guide) Part One by alesteir

Comments

50 comments [Add Comment](#)

[view all 517 comments](#)



tony youness says:
from where can I buy the controller. and can I have the electric diagram

Mar 28, 2010. 12:12 PM [REPLY](#)



gadget says:
Love to build this cnc but I can't access imperial size mdf in australia. Would it be possible to scale the plans down slightly so that metric size sheets can be used? The closest thickness we have is 12mm mdf which is a 94.5% scale reduction on 1/2 inch which will also scale the 3/4 inch pieces nicely to 18mm (also commonly available).

Mar 5, 2010. 4:47 PM [REPLY](#)

Also the paper dimensions are showing in acrobat is 8x10?



fruttenboel says:

Mar 28, 2010. 12:01 PM [REPLY](#)

I live in Europe mainland. Our MDF and plywoods are rated in millimeters. But only for 'convenience'. If I measure the MDF, the 12 mm is 12,7 mm = 1/2". the 18 mm is 19 mm = 3/4". All sizes are in inches and feet. Full sheets are 122 cm x 244 cm. Not a logical ISO value. Concrete plywood is 125 x 250 cm. Now, THAT is an ISO size!

What it boils down to: 122 cm = 4 feet. 244 cm is 8 feet. MDF is always delivered in imperial units....



rumplesnitz says:

Mar 28, 2010. 3:41 AM [REPLY](#)

are you saying you cannot get 1/2 inch thick MDF in Australia? Is this some kind of import restriction? I'll be more than happy to set up an MDF import business because I can get you all of that you want straight from a local manufacturer near me.



tony youness says:

Mar 27, 2010. 2:23 AM [REPLY](#)

thank you for offering this site .This is really amazing . please can I have the all dimensions for the base .



abadv8 says:

Mar 22, 2010. 12:57 PM [REPLY](#)

If you plot the drawings on a laser printer, you can simply use a hot iron to transfer the details to your substrate as the toner is thermally activated...



slamsworld says:

Mar 21, 2010. 5:51 PM [REPLY](#)

I have completed this project after lots of research behind it - gave me wood the first time it run - this is such a fantastic tutorial the author deserves a Nobel Prize for what ever this qualifies for



davidbue says:

Mar 17, 2010. 5:01 AM [REPLY](#)

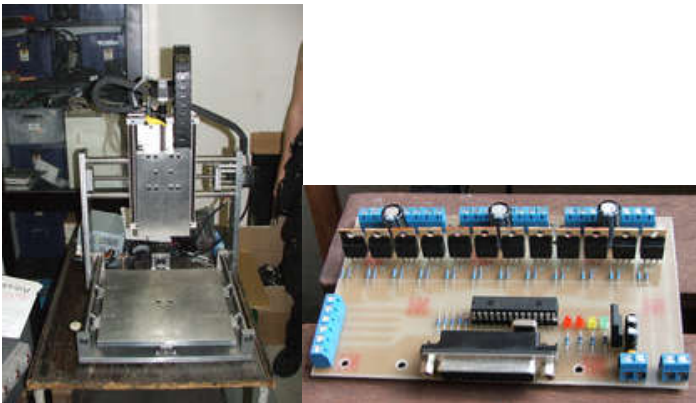
Hi all. Building a CNC router quickly becomes a big project. More a hobby that just a project you finish up.

I have built my own CNC mill capable of milling in softer metal alloys a few years ago. Using is and keeping it running takes up a lot of time but is also great fun.

I've made everything but the stepper motors and Win32 software myself. Hardware platform, electronics, PCB and micro-controller firmware. You can check out the build at my website: www.volunteerlabrat.com/cnc.html

Should you choose to make your own CNC mill then go for it. It's so much fun!

Cheers! David



dragonart777 says:

Mar 13, 2010. 9:27 PM [REPLY](#)

i got evething today but the motor and motherboard
i spent from 7 am to just know 12:13 am lining up the sheet's of paper
and cuting the wood out

for thow's that have not started get the layout printed at staple's ask for a 48"x48" well take a week to get it they well hafe to ship it well cost you 23\$
don't get it as a blueprint it will have line's in it that well mess you up on your cut's

if not have fun it well take you a good bit and a fest in the wall

2ed don't do what i did i used a jigsaw cause my roter router wen't up
i new i would not have a good cut from the start but i got a really good cut for it being a jigsaw bad timing for my roter router grrrr

as for that i got evething cut ill put it together tomorew wonce i get my motor's and all i thank ill just have my cnc cut me new board's thin replace it

thank's again out of every cnc i seen your's or the best and very easy to understand i feel like im building a \$5.000 cnc here i thot it was going to be
small but hmmm biger thin i thot i did extend the bass thow
couse after im done im going to extend everthing

p.s i am having fun with this project and it's not something that well take you one day so im really liking this



coolstuff100 says:

Mar 13, 2010. 6:32 PM [REPLY](#)

may you please make it so their is just a track and a turning nob with a gear or something **SIMPLE** !!!!!



dragonart777 says:

Mar 12, 2010. 3:59 AM [REPLY](#)

i started buy everthing for this last nite i got to get the wood today waiting on truck waking up 5 am geting everthng ready :)

got something to ask you thow not for me couse well i done gone throw this and sorry for the spelling here

i taken the meserment's to homedepo for the nut's and bolt's and well had a problem 0.25 is 1/4 in i not used to this meserment i felt like a noob walking into homedepo into i had 5 home depo worker's working on this with me lol is there a way you can post a txt or something for the next someone i allready got it figered out not hard to learn just did not know it

this my farst time even trying to build or run a cnc i built halfpipe's and music studio's so this won't be a problem

thank you for this by the way i spent 2 munth's studioing cnc programs' and looking for digram's and help out of all of thim i got every info off your page and even understand it better your's is allso the best i seen on here i well take a pic of it after done for you



tech3312 says:

Mar 6, 2010. 12:06 PM [REPLY](#)

Nice instructables on the CNC, i would like to double the size of this CNC machine. Which section of drawing do it have to expand so it can accomodate the design. I know that the Nema sockets and the screws cannot be doubled so i cannot tell the print 200% of it's actual size. I have autocad 2010 so i can edit the drawings. But do you know an easier way of doubling this size?



robotron997 says:

Mar 4, 2010. 9:01 PM [REPLY](#)

hi i am not able to understand how the motor is connected with the belt or the rail in the y axis and x axis can you explain it briefly



the merog says:

Mar 4, 2010. 9:51 AM [REPLY](#)

Can anybody help by answering this...

How to control the z-axis, if laser cutter is used (ON/OFF)?

Awaiting replies...//MEROG



214595 says:

Feb 25, 2010. 12:21 PM [REPLY](#)

hello i am interested in your plans but i have 3/4" MDF can i still make it or are there many changes that have to be made

if you can email me at nicholasfischer@rogers.com i would really apprecoate it



katzsplat says:

Feb 28, 2010. 9:23 PM [REPLY](#)

You won't be able to use 3/4" MDF without making some serious changes to the design. Home Depot has 8'x4'x0.5" MDF for ~\$22, which is enough to make two CNC machines. I'd recommend buying the correct thickness of MDF.



bullschmidt says:

Feb 23, 2010. 6:37 AM [REPLY](#)

Very interesting.. I was curious if you thought this would have the precision to be used as an additive printer as well, aka a repstrap/reprap. The large work area & higher speed seems very attractive (vs some lead screw CNCs).



zoltzerino says:

Feb 21, 2010. 12:26 PM [REPLY](#)

Right, I am completely new to this. Well not completely but.....

Once this is made, what are the practical purposes?

Can It make a copy of itself?

How do I tell it what to do?

Is that a normal drill or something specific?



katzsplat says:

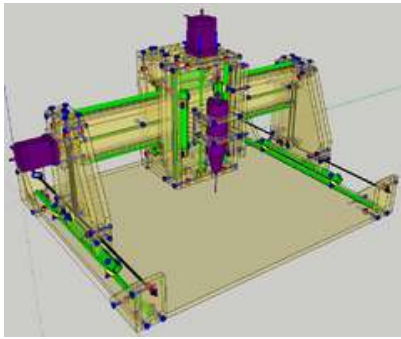
Dec 24, 2009. 12:24 AM [REPLY](#)

A big thanks to the author, oomlout for this terrific instructable. I read this about one year ago, and purchased a kit from outland86 soon after. I now have a fully working CNC machine thanks to them!

I want to provide a 3D model of this machine that I made in Google Sketchup for everyone to use to help learn more about how this machine fits together. I've checked with the author, and he's fine with me providing it to the community. I wish I had something like the model when I was first assembling the machine; it took a lot of trial-and-error to figure it all out. Hopefully this model will make the road easier for future CNC'ers.

I made this model because I plan to expand the Y-axis to 36", so now I have a virtual copy of my machine to modify. Enjoy!

<http://sketchup.google.com/3dwarehouse/details?mid=23e1c5366b479dca8963c446242873ee>



waynerod says:
So is this the modified version or the original one? Please tell me...

Feb 14, 2010. 12:31 PM [REPLY](#)



katzsplat says:
This is the original model, as designed by author. I have not shared my expanded design with anyone else.

Feb 15, 2010. 5:30 AM [REPLY](#)



waynerod says:
OK Thanks!!
Just what I was hoping for... I wanted the original version...

Thanks a lot for sharing this!!

-Wayne Rodrigues.

Feb 15, 2010. 10:38 PM [REPLY](#)



stewartlab says:
do you mind exporting this in a separate format other than Sketchup???

Jan 5, 2010. 4:19 PM [REPLY](#)



katzsplat says:
Sorry, I can't do that. The Pro version of Google Sketchup is required to export to other formats, but I only use the free version. Anyone who has Sketchup Pro could do this very easily, any volunteers?

Jan 23, 2010. 8:32 AM [REPLY](#)



robotguy4 says:
"The Pro version of Google Sketchup is required to export to other formats..."
Not its not. You just got to add some things to it.

Jan 23, 2010. 11:06 AM [REPLY](#)

Waddya want to export the file as? STL? DXF? OBJ? .X? Find the ruby script you want, download and install it .

By the way, Google Sketchup (free version) can also export COLLADA files (.dae or Digital Asset Exchange), which can be imported into a variety of other programs...



katzsplat says:
Sounds good robotguy4!

Jan 23, 2010. 12:45 PM [REPLY](#)

To the rest of you: now you've got an easy way to convert the sketchup model to whatever format your heart desires. Enjoy!



jeff-o says:
Very cool, thanks for doing this!

Jan 5, 2010. 11:38 AM [REPLY](#)



piant says:
how can I buy and allready made system like this one.

Feb 15, 2010. 6:59 AM [REPLY](#)



waynerod says:
Hi,
When you say X Axis Travel, you mean the distance the Dremel travels along the X axis?

Or do you mean that is the horizontal part of the base?

I guess it might be the first one right?

-Wayne Rodrigues.

Feb 11, 2010. 12:43 AM [REPLY](#)



waynerod says:

Could anyone please tell me the measurements for the base??

Please.....

-Wayne Rodrigues.

Feb 12, 2010. 3:13 PM [REPLY](#)



katzsplat says:

Wayne,

The footprint of this machine is 31 inches on the X Axis, 25 inches on the Y axis. The X Axis travel is about 14.5 inches, and the Y Axis travel is about 10 inches.

You can learn more about the dimensions if you download my Sketchup 3D model of this machine, which I posted down below.

Feb 14, 2010. 7:52 AM [REPLY](#)



waynerod says:

Thanks a lot!!!

Feb 14, 2010. 12:31 PM [REPLY](#)



outland86 says:

Electronics for the router

The Best way to Run this Machine is to use a free version of MACH 3 software up to 500 lines of gcode. available form Artsofts website of you can buy it at www.makecnc.com

use it with a driver board that uses step and direction signals these are available for under \$200 also at the URL above if you like.

you will need something like a 24 volt 6.5 amp power supply to run the driver board available on ebay just search under 24 volt CNC power supply. about \$30 bucks

also paralell cable ,also available on ebay just search for CNC cable about \$4
4 wire security wire for hook up from home depot.

you can use small nema 23 steppers available plenty of places and at www.makecnc.com

if you get the whole package from makecnc.com you get a configuration file to set the whole thing up turn key so you dont have to worry about trying to figure out the number of turns a screw will move the dremel and the belts etc etc. and port and pin setups

Just thought i would let you all know something about the electronics side of this project as someone asked about ports and pins

Feb 14, 2010. 10:20 AM [REPLY](#)



thelastonekills says:

this cnc runs off what ports best

Feb 12, 2010. 10:29 PM [REPLY](#)



waynerod says:

Do you have a PDF file for A4 sized printing? Please.... This is instead of CNC-05-MDF-CutPattern(Rev3).pdf

Please... this would help me heaps as I don't have access to Letter Page Sizes (incase you don't know the size you have given for is for "Letter")

By the way, it will make a difference if I use A4 and Letter right? Coz this is designed for Letter and if I use A4 it won't be right.....

Feb 11, 2010. 12:54 AM [REPLY](#)



gdykes says:

All finished! Machine works great! Constructed from 7 layer 1/2" plywood. Total cost under 500.00 and 2 weeks of construction in my spare time. I have photos if you are interested. Thank you

Jul 29, 2009. 9:08 AM [REPLY](#)



dcorbett says:

Do you have drawings, pictures, etc?

I am researching the CNC market, and cannot decide whether to start small, or start with the one I want...

What software, controllers, etc did you use?


Thanks,


Doug


skibum2b@yahoo.com


Feb 5, 2010. 9:41 AM [REPLY](#)


 **xx123j** says: Jan 25, 2010. 4:09 PM [REPLY](#)
+1 on that 3M spray adhesive.
Also what would it take to get this to mill nonferrous metals?


 **AllenKII** says: Dec 18, 2008. 7:53 AM [REPLY](#)
For sticking down the paper, you could use rubber cement. I used to use it all the time for temporary gluing of paper patterns. It works quite well, and peels off with no residue. I've used it mostly on sheet metal, so the MDF may react differently. But it may be an option.


 **wulfhardt** says: Jan 11, 2009. 4:36 PM [REPLY](#)
Regular ol' 3M "77" spray adhesive also works well. Lay down a non-overlapping layer of wide masking tape/painter's tape over your work piece, then spray the backside of your pattern with 77, then stick it to the tape layer. After cutting is completed, the tape makes it easy to remove the pattern.


 **ddl5290** says: Jan 24, 2010. 5:45 PM [REPLY](#)
Trust me.. wulfhardt is right on.
I layed down the masking tape, then sprayed the 77 on both the tape and back of the paper.. it dried in a few minutes and worked very well.. stayed on well for the cut process, and
I had to go back and make some different motor spacers (to fit my motors) and just glued it to the mdf.. and wow I'm really glad I did that.


 **cerberoos** says: Jan 22, 2010. 10:15 AM [REPLY](#)
what is the tolerance of this machine? Can it drills only foam or have a good precision also for wood?

 **huntervalley** says: Jan 10, 2010. 1:37 PM [REPLY](#)
Would you sell a complete unit? If yes how much including delivery to Australia SYDNEY
Thanks in advance
JC


 **outland86** says: Jan 17, 2010. 7:03 AM [REPLY](#)
shipping a complete kit to sydney costs about \$800 usd not economical i have checked but you will soon be able to get the FAB files(Gcode and instructions) from my website www.makecnc.com to be able to have one cut out for you no matter where in the world you are about two weeks and they will be available

 **agent** says: Jan 17, 2010. 12:02 AM [REPLY](#)
Sweet, I want to build this so I can quit using my school's Epilog. I've been laser engraving everything! If I can make this I could finally etch my own PCBs.
But first: I'll make the acrylic version on my school's Epilog :P

 **blackgear07** says: Jan 15, 2010. 11:01 AM [REPLY](#)
Hello, i'm very overextended to find the right parts (screws, nuts and other), because im from germany and i don't know the right dimension in metric! please, could you help me and tell me the metric measure ?

 **oscarthompson** says: Jan 15, 2010. 12:34 PM [REPLY](#)
You could use a converter, you won't need the mesurements to much in this project, as you work from a template. I normally use metric measure but imperial shouldn't be so hard (12 inches = 1ft).
Oscar

 **blackgear07** says: Jan 16, 2010. 2:49 AM [REPLY](#)
what is the difference between Nut 8mm and Nut #8?
for that is no converter!

 **oscarthompson** says: Jan 16, 2010. 2:59 AM [REPLY](#)
#8 means number eight Nuts, I would suggest you get them from where he gets them or some where equivlent

 **oscarthompson** says: Jan 10, 2010. 12:57 PM [REPLY](#)
what at the cross nuts for? can i use something instead

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<http://www.instructables.com/id/How-to-Make-a-Three-Axis-CNC-Machine-Cheaply-and/>

[view all](#)

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