

# Designing Projects on a Computer

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## Computer Aided Designing (CAD)

### Why Use CAD for DIY Projects?

Serious DIY-ers have an engineering mindset. I believe they enjoy designing (engineering) a project as much as they enjoy building it. There are some projects where I spend more time in the planning phase than in the building phase.

Of course, I'm talking about DIY projects like building a greenhouse, or a murphy bed, or a solar hot water system. Simple projects like putting up a clothesline don't merit this kind of planning.

In the planning phase there is research to be done. We are fortunate in our day to have lots of resources to help us with this (DIY-ers love to share on their websites, youtube, feedback in product reviews, etc.).

Once we have a pretty good idea of how we want to proceed with our project, we can use CAD to "build" it on the computer. This costs nothing to do (except for time). Visualizing our project allows us to spot potential problems and play with various ways of building the project. Sometimes I find that my initial "design" just isn't going to work and I start over (do more research and come back to the CAD design). Or, while designing the project on the computer I think of ways to modify the project that will make it better, easier to build and even less expensive to build.

Yes, this takes more time in the planning phase, but the building phase goes **much** more quickly with few (if no) mistakes or do-overs. And, if you're like me, I love to share what I've done with others. Showing CAD illustrations along with pictures and videos really helps me to document the project and make it clearer for others to follow. I even make some of my CAD drawings available for others so they don't have to do all that work from scratch.

### Examples of Using CAD in My Projects

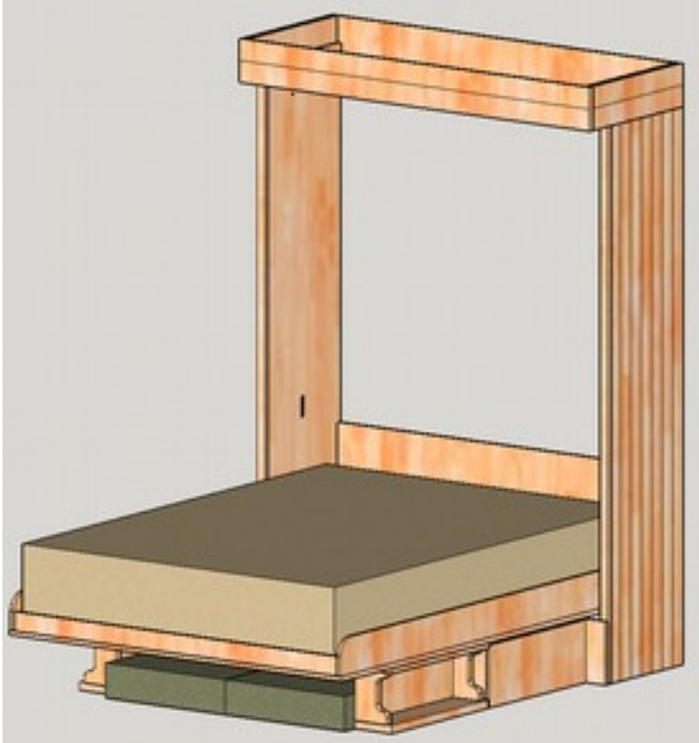
Here are a few examples of how I have used CAD for some of my projects.

I designed my entire house including the greenhouse.	
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I sent the house design to an architect and had house plans drawn up. I also built the house and greenhouse myself.

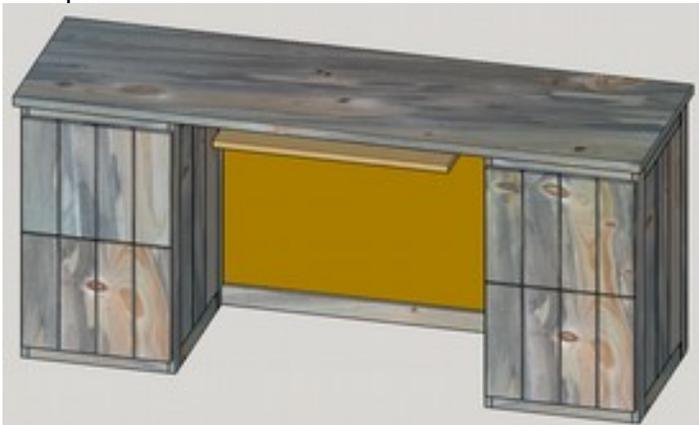


Murphy bed in up position



Murphy Bed in down position

Computer Desk



I can't tell you how much time, money and mistakes I saved by designing projects on CAD before I started the actual project.

# Which CAD Software Do I Use?

## Disclaimer and Encouragement

In part of my work history I did a lot of computer aided design (CAD). I was skilled in multiple CAD software including Cadkey, Autocad, CATIA, Solidworks, Pro/Engineer, Creo, etc. So, I have a BIG advantage over most DIY-ers when it comes to using CAD to design my home projects.

Having said that, as a DIY-er (and being retired) I am always interested in the lowest cost option (free is best!) for my projects. That includes deciding on what CAD software to use.

Also, I have seen many DIY-er's that had no CAD experience and have learned to use CAD in their projects quite effectively.

Yes, there is a time investment in learning CAD, but it's a new skill that you'll really be glad you developed. You'll spend time learning how to use a router or table saw. Think of CAD as another tool to put in your toolkit. You'll be glad you did.

## My Choice

There are a lot of choices for home-use CAD, both free and not-free. I have not tried all the available free CAD software out there, so I'm not going to be able to give you a recommendation that is in-depth and comprehensive. I'll just tell you what I use and you can feel free to disagree or research other options.

## SketchUp

I have been using SketchUp (SU) for years and I love it. I use it to design many of my projects before I start buying materials or starting work.

Here's a Wiki article on SketchUp:

<https://en.wikipedia.org/wiki/SketchUp>

I use **SU Make 2017** which is free for non-commercial use. You can download this and install it on a Windows or Mac computer. For Linux users (which I am), SU runs just fine in a VMWare (which is also free) Windows virtual machine.

Trimble (makers of SU) is not releasing any more updated free versions for local installation on a computer. They now have a browser-based free application (SketchUp Free). I find this to be too limiting and slow. It's just a way to get people "in

the door” and up-sell them to a non-free version. The web version is fun to play with, but I wouldn’t use it for my projects.

You can still download **SU Make 2017** here:

<https://help.sketchup.com/en/downloading-older-versions>

**SU Pro** is free for 30 days and then you have to pay for it. **SU Pro** includes the Layout module which is for generating professional prints and drawings. **SU Make 2017** is totally free. It doesn’t include the Layout module. I find it quite adequate for my projects. It does have some rudimentary dimensioning capabilities and I use that if I need to create drawings with some dimensions on it.

It takes a while to really learn SU but it’s well worth it if you do much designing and woodworking. I actually designed my new house in SU and then sent the model off to an architect to create finished blueprints. I also designed several woodworking projects, a greenhouse, solar collection system, garden, etc. in SU.

There is quite a large community of SU users who create models and upload them into a space called 3D Warehouse. It’s amazing how many free models there are available to download. When I designed my house, I populated it with furniture from the 3D Warehouse. I didn’t spend any time making the furniture pieces. I just found ones that were somewhat close to what I had and downloaded them. If a dining room table model was a little longer than what I actually had, I simple scaled it to make it reflect the dimensions of my table.

The 3D functionality really enables you to see your project from all angles, check for fits, etc.

I have concerns about SketchUp’s future. They just released the 2019 version and are moving to a subscription-based model. Bottom line: more expensive and restrictive. I don’t know how much longer the free 2017 version is going to be available.

Another option to consider for 3D design is Autodesk Fusion 360. It is also free for personal use as well as limited professional use. I did a little research on this and it looks very powerful but could be pretty difficult to learn depending on your background and skills.

## Summary

I can’t stress enough how powerful (and fun) it is to design your project in CAD before you start. If you take the time to learn this tool you’ll be glad you did.